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U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LABORATORY TEST PROCEDURE

FOR

FMVSS 209

Seat Belt Assemblies

ENFORCEMENT
Office of Vehicle Safety Compliance
Room 6111, NVS-220
400 Seventh Street, SW
Washington, DC 20590

OVSC LABORATORY TEST PROCEDURE NO. 209
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REVISION CONTROL LOG
FOR OVSC LABORATORY
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TP209
SEAT BELT ASSEMBLIES

TEST PROCEDURE		FMVSS 209		DESCRIPTION
REV. No.	DATE	AMENDMENT	EFFECTIVE DATE	
00	4/1/71	32FR2415	3/1/67	Original release signed by O.D.
01	7/12/73	36FR17430	1/1/72	Minor revisions
02	6/16/93	N.A.	N.A.	Conversion to WordPerfect
03	3/2/98	N.A.	N.A.	Major revision
04	3/22/01			Minor revisions and conversion to Microsoft Word
05	1/17/2003	N.A.	N.A.	Changed English units to metric, changed images to Word pictures and changed washing procedure.
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1. PURPOSE AND APPLICATION

The Office of Vehicle Safety Compliance (OVSC) provides contractor laboratories with Laboratory Test Procedures as guidelines for obtaining compliance test data. The data are used to determine if a specific vehicle or item of motor vehicle equipment meets the minimum performance requirements of the subject Federal Motor Vehicle Safety Standard (FMVSS). The purpose of the OVSC Laboratory Test Procedures is to present a uniform testing and data recording format, and provide suggestions for the use of specific equipment and procedures. If any contractor views any part of an OVSC Laboratory Test Procedure to be in conflict with a Federal Motor Vehicle Safety Standard (FMVSS) or observes deficiencies in a Laboratory Test Procedure, the contractor is required to advise the Contracting Officer's Technical Representative (COTR) and resolve the discrepancy prior to the start of compliance testing.

Every contractor is required to submit a detailed test procedure to the COTR before initiating the compliance test program. The procedure must include a step-by-step description of the methodology to be used. The contractor's test procedure shall contain a complete listing of test equipment with make and model number and a detailed check-off sheet. The list of test equipment shall include instrument accuracy and calibration dates. All equipment shall be calibrated in accordance with the manufacturer's instructions. There shall be no contradictions between the Laboratory Test Procedure and the contractor's in-house test procedure. Written approval of the in-house test procedures shall be obtained from the COTR before initiating the compliance test program. The OVSC Laboratory Test Procedures are not intended to limit or restrain a contractor from developing or utilizing any testing techniques or equipment, which will assist in procuring the required compliance test data. These Laboratory Test Procedures do not constitute an endorsement or recommendation for use of any product or method. However, the application of any such testing technique or equipment is subject to prior approval of the COTR.

NOTE: The OVSC Laboratory Test Procedures, prepared for the limited purpose of use by independent laboratories under contract to conduct compliance tests for the OVSC, are not rules, regulations or NHTSA interpretations regarding the meaning of a FMVSS. The Laboratory Test Procedures are not intended to limit the requirements of the applicable FMVSS(s). In some cases, the OVSC Laboratory Test Procedures do not include all of the various FMVSS minimum performance requirements. Recognizing applicable test tolerances, the Laboratory Test Procedures may specify test conditions that are less severe than the minimum requirements of the standard. In addition, the Laboratory Test Procedures may be modified by the OVSC at any time without notice, and the COTR may direct or authorize contractors to deviate from these procedures, as long as the tests are performed in a manner consistent with the standard itself and within the scope of the contract. Laboratory Test Procedures may not be relied upon to create any right or benefit in any person. Therefore, compliance of a vehicle or item of motor vehicle equipment is not necessarily guaranteed if the manufacturer limits its certification tests to those described in the OVSC Laboratory Test Procedures.

2. GENERAL REQUIREMENTS

FMVSS 209, Seat Belt Assemblies, specifies requirements for seat belt assemblies used in passenger cars, multipurpose passenger vehicles (MPVs), trucks, and buses. The standard requires that a seat belt assembly shall be designed for use by one, and only one, person at any one time. The assembly shall provide pelvic restraint whether or not upper torso restraint is provided, and the pelvic restraint shall be designed to remain on the pelvis under all conditions, including collision or rollover of the motor vehicle. A Type 2 seat belt assembly shall provide upper torso restraint without shifting the pelvic restraint into the abdominal region. An upper torso restraint shall be designed to minimize vertical forces on the shoulders and spine. Hardware for upper torso restraint shall be so designed and located in the seat belt assembly that the possibility of injury to the occupant is minimized.

All hardware parts, which contact under normal usage a vehicle occupant, clothing, or webbing shall be free from burrs and sharp edges. Seat belt assemblies shall be provided with a buckle readily accessible to the occupant to permit his or her easy and rapid removal from the assembly. Buckle release mechanism shall be designed to minimize the possibility of accidental release. A buckle with release mechanism in the latched position shall have only one opening in which the tongue can be inserted on the end of the buckle designed to receive and latch the tongue.

The ends of webbing in a seat belt assembly shall be protected or treated to prevent raveling. The end of the webbing in a seat belt assembly having a metal-to-metal buckle that is used by the occupant to adjust the size of the assembly shall not pull out of the adjustment hardware at the maximum size adjustment. Provisions shall be made for essentially unimpeded movement of webbing routed between the seat back and seat cushion and attached to a retractor located between the seats.

Each seat belt assembly shall be permanently and legibly marked or labeled with year of manufacture, model, and name or trademark of manufacturer or distributor, or of importer if manufactured outside the United States. A model shall consist of a single combination of webbing having a specific type of fiber weave and construction, and hardware having a specific design. Webbings of various colors may be included under the same model, but webbing of each color shall comply with the webbing requirements.

The width of the webbing in a seat belt assembly shall be not less than 46 mm, except for portions that do not touch a 95th percentile adult male dummy with the seat in any adjustment position and the seat back in the manufacturer's nominal design riding position. Type 1 seat belt assemblies shall have a breaking strength of 26,689 N, and Type 2 assemblies shall have a breaking strength of 22,241 N for the pelvic belt portion and 17,793 N for the upper torso belt portion. The webbing in a Type 1 assembly shall not elongate more than 20 percent at 11,120 N, and the webbing in a Type 2 assembly shall not elongate more than 30 percent at 11,120 N for the pelvic belt portion and 40 percent at 11,120 N for the upper torso belt portion.

2. GENERAL REQUIREMENTS....Continued

Seat belt assemblies shall be capable of adjustment to fit occupants whose dimensions and weight range from those of a 5th percentile adult female (height of 4 feet, 11 inches, weighing 46.3 kg and having a waist circumference of 599 mm) to those of a 95th percentile adult male (height of 6 feet, 0.8 inches, weighing 97.5 kg and having a waist circumference of 1080 mm). The assembly shall have an automatic locking retractor (ALR), an emergency locking retractor (ELR), or an adjusting device that is within the reach of the occupant.

The following is a summary of adult occupant measurements:

	5th Percentile Adult Female	**95th Percentile Adult Male**
Weight	46.3 kg	97.5 kg
Erect Sitting Height	785 mm	965 mm
Hip Breadth--Sitting	325 mm	419 mm
Hip Circumference--Sitting	925 mm	1199 mm
Waist Circumference--Sitting	599 mm	1080 mm
Chest Depth	190 mm	267 mm
Chest Circumference--Nipple	775 mm	1130 mm
Chest Circumference--Upper	757 mm	1130 mm
Chest Circumference--Lower	676 mm	1130 mm

3. SECURITY

The contractor shall provide appropriate security measures to protect the OVSC test equipment from unauthorized personnel during the entire compliance testing program. The contractor is financially responsible for any acts of theft and/or vandalism, which occur during the storage of seat belt assemblies. Any security problems which arise shall be reported by telephone to the Industrial Property Manager (IPM), Office of Contracts and Procurement, within two working days after the incident. A letter containing specific details of the security problem will be sent to the IPM (with copy to the COTR) within 48 hours.

The contractor shall protect and segregate the data that evolves from compliance testing before and after each seat belt assembly test. No information concerning the safety compliance testing program shall be released to anyone except the COTR, unless specifically authorized by the COTR or the COTR's Division Chief.

NOTE: NO INDIVIDUALS, OTHER THAN CONTRACTOR PERSONNEL DIRECTLY INVOLVED IN THE COMPLIANCE TESTING PROGRAM, SHALL BE ALLOWED TO WITNESS ANY COMPLIANCE TEST UNLESS SPECIFICALLY AUTHORIZED BY THE COTR.

4. GOOD HOUSEKEEPING

Contractors shall maintain the entire compliance testing area, test fixtures and instrumentation in a neat, clean and painted condition with test instruments arranged in an orderly manner consistent with good test laboratory housekeeping practices.

5. TEST SCHEDULING AND MONITORING

The contractor shall submit a test schedule to the COTR prior to compliance testing. Tests shall be completed as required in the contract. All testing shall be coordinated to allow monitoring by the COTR.

6. TEST DATA DISPOSITION

The contractor shall make all preliminary compliance test data available to the COTR on location within four hours after the test. Final test data, including digital printouts and computer generated plots (if applicable), shall be furnished to the COTR within five working days. Additionally, the contractor shall analyze the preliminary test results as directed by the COTR. All backup data sheets, strip charts, recordings, plots, technicians notes, etc., shall be either sent to the COTR or destroyed at the conclusion of each delivery order, purchase order, etc.

7. GOVERNMENT FURNISHED TEST ITEMS (GFTI)

The Contractor has the responsibility of accepting seat belt assemblies delivered from either motor vehicle or seat belt assembly manufacturers or seat belt assembly distributors. In both instances, the contractor acts in the OVSC's behalf when signing an acceptance of GFTI.

Each seat belt assembly shall be permanently marked with a GROUP and SPECIMEN number prior to compliance testing in order to prevent improper test sequencing. The marking shall withstand testing and handling. Manufacturer's data such as model and part numbers shall be recorded for each seat belt assembly prior to compliance testing. No testing shall begin until the contractor has received the verification statement for the seat belt assembly from the manufacturer.

All seat belt assemblies shall be stored in a clean, dry storage area to prevent deterioration of the test specimens in any manner, which might affect test results. The seat belt assemblies shall not be altered for any reason without the written consent of the COTR.

The automatic locking feature of an emergency locking retractor shall not be removed without written instructions from the manufacturer and the written consent of the COTR.

All seat belt assemblies shall be inspected and inventoried within one week of receipt by the contractor. A Monthly Status Report shall be submitted by the contractor to the COTR and a suggested format is shown below.

7. GOVERNMENT FURNISHED TEST ITEMS (GFTI)....Continued

SAMPLE OF MONTHLY STATUS REPORT:

FMVSS 209 MONTHLY STATUS REPORT

Contract No.: _____ Date: _____

A. SUMMARY TABLE

GRP NO.	VEH MFR	VEHICLE MODEL	SEAT BELT MFR	BELT MODEL NO.	DATE RECVD	TEST START DATE	TEST COMPL. DATE	DATE REP. MAILED	COMMENTS
001									
002									
003									
004									
005									
006									
007									
008									
009									
010									
011									
etc.									

B. Tests scheduled for next reporting period (assy. model(s) scheduled for testing):

C. Description of any problems and/or delays in testing:

D. Description of specific actions taken to correct problems and/or delays:

8. CALIBRATION OF TEST INSTRUMENTS

Before the contractor initiates the safety compliance test program, a test instrumentation calibration system will be implemented and maintained in accordance with established calibration practices. Guidelines for setting up and maintaining such calibration systems are described in ANSI/NCSL Z540-1-1994, "Calibration System Requirements." The calibration system shall be set up and maintained as follows:

A. Standards for calibrating the measuring and test equipment will be stored and used under appropriate environmental conditions to assure their accuracy and stability.

B. All measuring instruments and standards shall be calibrated by the contractor, or a commercial facility, against a higher order standard at periodic intervals NOT TO EXCEED TWELVE (12) MONTHS! Records, showing the calibration traceability to the National Institute of Standards and Technology (NIST), shall be maintained for all measuring and test equipment.

C. All measuring and test equipment and measuring standards will be labeled with the following information:

(1) Date of calibration

(2) Date of next scheduled calibration

(3) Name of the technician who calibrated the equipment

D. A written calibration procedure shall be provided by the contractor, which includes an equipment list and calibration record to provide as a minimum the following information for all measurement and test equipment:

(1) Laboratory identification number for equipment

(2) Instrument description or type

(3) Instrument manufacturer

(4) Serial and/or model number

(5) Measurement range

(6) Accuracy

(7) Features

(8) Frequency of calibration

8. CALIBRATION OF TEST INSTRUMENTS....Continued

(9) Date of last calibration

(10) Type of standard used to calibrate the equipment (calibration traceability of the standard must be evident)

E. Records of calibration for all test instrumentation shall be kept by the contractor in a manner which assures the maintenance of established calibration schedules. All such records shall be readily available for inspection when requested by the COTR. The calibration system will need the acceptance of the COTR before the test program commences.

9. PHOTOGRAPHIC DOCUMENTATION

Photographs shall be color, 8 x 10 inches, and legible. A tag, label or placard identifying the seat belt assembly shall appear in each photograph and be legible. Each photograph shall be labeled as to subject matter. The test setup and equipment used in all tests shall be photographed for the record before and at prescribed time periods during testing listed in this test procedure.

A. Photographs for every assembly performance test configuration will be taken and kept with the data sheets. These photographs will encompass each phase of testing, i.e., pelvic loop load, upper torso loop load, common hardware.

B. A photograph and detailed description of a FAILURE for all testing will be recorded. The detailed mode will be entered in the test report. The failure must be photographed at various angles to assure complete coverage.

Each test report shall contain the following photographs when applicable:

A. Photograph of the tested seat belt assembly with label showing

B. Photograph of disassembled tested specimen

C. Photographs of typical setups for performing the following tests:

(1) Webbing Elongation and Breaking Strength

(2) Webbing Abrasion (Hex Bar and Buckle Tests)

(3) Assembly Performance Loop Load

(4) Assembly Performance Buckle Release Force

(5) Retractor Acceleration (Emergency Locking Retractor ONLY)

9. PHOTOGRAPHIC DOCUMENTATION....Continued

(6) Retractor Cycling

D. Applicable failure photographs with narrative description of the failure

10. DEFINITIONS

ADJUSTMENT HARDWARE

Any or all hardware designed for adjusting the size of a seat belt assembly to fit the user, including such hardware that may be integral with a buckle, attachment hardware, or retractor.

ATTACHMENT HARDWARE

Any or all hardware designed for securing the webbing of a seat belt assembly to a motor vehicle.

AUTOMATIC LOCKING RETRACTOR (ALR)

A retractor incorporating adjustment hardware by means of a positive self-locking mechanism which is capable when locked of withstanding restraint forces.

BUCKLE

A quick release connector which fastens a person in a seat belt assembly.

EMERGENCY LOCKING RETRACTOR (ELR)

A retractor incorporating adjustment hardware by means of a locking mechanism that is activated by vehicle acceleration, webbing movement relative to the vehicle, or other automatic action during an emergency and is capable when locked of withstanding restraint forces.

HARDWARE

Any metal or rigid plastic part of a seat belt assembly.

LOAD LIMITER

A seat belt assembly component or feature that controls tension on the seat belt to modulate the forces that are imparted to occupants restrained by the belt assembly during a collision.

10. DEFINITIONS....Continued

NONLOCKING RETRACTOR

A retractor from which the webbing is extended to essentially its full length by a small external force, which provides no adjustment for assembly length, and which may or may not be capable of sustaining restraint forces at maximum webbing extension.

PELVIC BELT RESTRAINT

A seat belt assembly or portion thereof intended to restrain movement of the pelvis.

RETRACTOR

A device for storing part or all of the webbing in a seat belt assembly.

SEAT BELT ASSEMBLY

Any strap, webbing, or similar device designed to secure a person in a motor vehicle in order to mitigate the results of any accident, including all necessary buckles and other fasteners, and all hardware designed for installing such seat belt assembly in a motor vehicle. A Type 2 continuous webbing seat belt assembly is shown in Figure 1.

SEAT BACK RETAINER

The portion of some seat belt assemblies designed to restrict forward movement of a seat back.

STRAP

A narrow non-woven material used in a seat belt assembly in place of webbing.

TYPE 1 SEAT BELT ASSEMBLY (T1)

A lap belt for pelvic restraint.

TYPE 2 SEAT BELT ASSEMBLY (T2) – SEE FIGURE 1

A combination of pelvic (lap) and upper torso (shoulder) restraints.

TYPE 2A UPPER TORSO (SHOULDER) BELT (T2A)

An upper torso (shoulder) restraint for use only in conjunction with a pelvic (lap) belt as a T2 seat belt assembly.

10. DEFINITIONS....Continued

TYPE 2 CONTINUOUS WEBBING
SEAT BELT ASSEMBLY

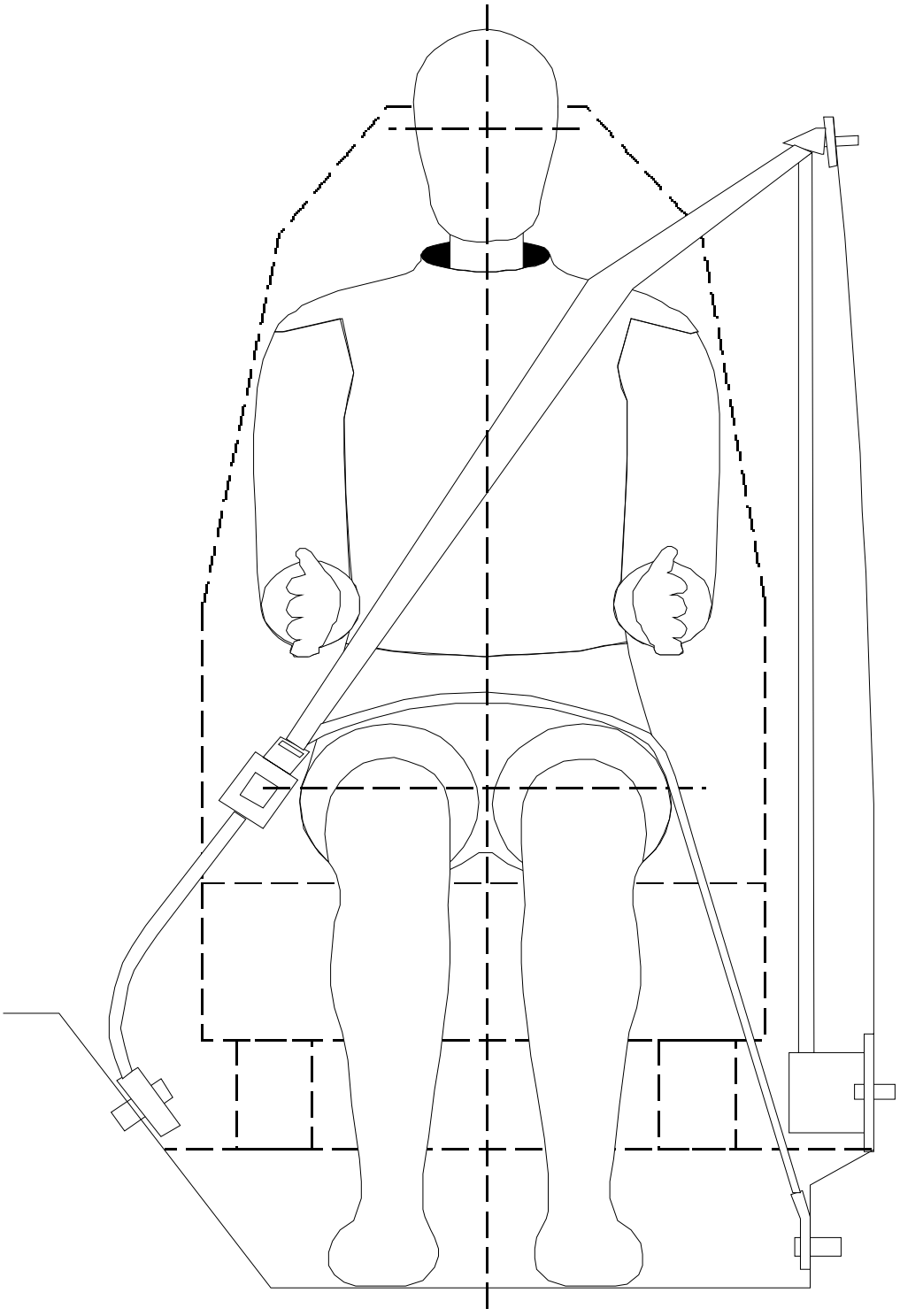


FIGURE 1

10. DEFINITIONS....Continued

UPPER TORSO (SHOULDER) BELT RESTRAINT

A portion of a seat belt assembly intended to restrain movement of the chest and shoulder regions.

WEBBING

A narrow fabric woven with continuous filling yarns and finished selvages.

11. PRETEST REQUIREMENTS

Prior to conducting any compliance test, contractors are required to submit a detailed in-house compliance test procedure to the COTR which includes a step-by-step description of the methodology to be used. Written approval must be obtained from the COTR before initiating the compliance test program so that all parties are in agreement.

TEST DATA LOSS

A compliance test is not to be conducted unless all of the various test conditions specified in the applicable OVSC Laboratory Test Procedure have been met. Failure of a contractor to obtain the required test data and to maintain acceptable limits on test parameters in the manner outlined in the applicable OVSC Laboratory Test Procedure may require a retest at the expense of the contractor. The retest costs will include the cost of the replacement item of motor vehicle equipment and all costs associated with conducting the retest. The original test specimen used for the invalid test shall remain the property of OVSC, and the retest specimen shall remain the property of the contractor. If there is a test failure, the contractor shall retain the retest specimen for a period not exceeding 180 days. If there is no test failure, the Contractor may dispose of the test specimen upon notification from the COTR that the final test report has been accepted.

The Contracting Officer of NHTSA is the only NHTSA official authorized to notify the contractor that a retest is required. The retest shall be completed within two (2) weeks after receipt of notification by the Contracting Officer that a retest is required. If a retest is conducted, no test report is required for the original test.

12. COMPLIANCE TEST EXECUTION

TEST PERSONNEL PERFORMANCE

Personnel supervising and/or performing the compliance test program shall be thoroughly familiar with the requirements, test conditions, and equipment for the test to be conducted.

RECEIVING-INSPECTION OF TEST EQUIPMENT

Inspect all hardware for burrs and sharp edges. Inspect each seat belt assembly release mechanism for the possibility of accidental release and verify that the attachment hardware is included. Inspect the ends of the webbing to ascertain that raveling will be prevented.

TEST SEQUENCES

Specific test requirements and procedures follow and are divided into four sub-groups.

GROUP A – Webbing Elongation and Breaking Strength (test samples 1 through 3)

GROUP B – Webbing Abrasion (test samples 4 through 6)

GROUP C – Hardware and Assembly Performance (test samples 7 through 9)

GROUP D – Retractor Performance (test samples 10 through 12)

Each sub-group has been designed to allow the laboratory technician to perform the tests with a minimum amount of reference to FMVSS 209. Data forms have also been provided with each procedure. The data forms should constitute a data package where the data forms utilized during the test sequences are in consecutive order and each data sheet contains a space for recording the GROUP NUMBER. Where appropriate, references are made [in brackets] to the applicable FMVSS 209 section. For example, [S5.2(j)] would refer to section 5.2(j) in 49 CFR 571.209 (FMVSS 209).

12. COMPLIANCE TEST EXECUTION....Continued

OUTLINE OF TEST SEQUENCE

A. WEBBING ELONGATION AND BREAKING STRENGTH
GROUP A (Test Samples 1, 2 and 3)

(1) Webbing Width

(a) Conditioning

(b) Measure width during elongation test (46 mm minimum width)

(2) Webbing Maximum Elongation

(a) 20% at 11,120 N — Type 1

(b) 30% at 11,120 N — Type 2 (Pelvic)

(c) 40% at 11,120 N — Type 2 (Upper Torso)

(3) Webbing Breaking Strength

(a) Minimum of 26,689 N — Type 1

(b) Minimum of 22,241 N — Type 2 (Pelvic)

(c) Minimum of 17,793 N — Type 2 (Upper Torso)

(d) Calculate median breaking strength

(4) Resistance to Light

(a) Light exposure (carbon-arc), 100 hours

(b) Perform breaking strength test

(c) Calculate percentage breaking strength retained

NOTE: Must retain a minimum of 60% of median breaking strength calculated in A.3(d), Webbing Breaking Strength

12. COMPLIANCE TEST EXECUTION....Continued

AND, IF REQUIRED

(5) Resistance to Micro-Organisms

(a) Soil burial for 2 weeks

(b) Perform breaking strength test

(c) Calculate percentage breaking strength retained

NOTE: Must retain a minimum of 85% of median breaking strength calculated in A.3(d), Webbing Breaking Strength

B. WEBBING ABRASION GROUP B (Test Samples 4, 5 and 6)

(1) Abrasion Resistance Test

(a) General Conditioning

(b) Abrasion Conditioning for 2,500 cycles

(c) Breaking Strength (must retain 75% of required breaking strength)

- 20,017 N – Type 1
- 16,681 N – Type 2 (Pelvic)
- 13,345 N – Type 2 (Upper Torso)

C. HARDWARE AND ASSEMBLY PERFORMANCE GROUP C (Test Samples 7, 8 and 9)

(1) Hardware Corrosion Resistance Test

(a) Salt Spray Test (24 hours of exposure time)

(b) Dry for one hour

(c) Repeat (a) and (b) for attachment hardware near floor

(d) Wash assemblies

(e) Dry for 24 hours

(f) Inspection of assemblies

12. COMPLIANCE TEST EXECUTION....Continued

(2) Temperature Resistance Test

(a) 80°C (176°F) Temperature for 24 hours over water

(b) 80°C (176°F) Temperature for 24 hours in dry oven

(3) Attachment Hardware Strength Test

(4) Adjustment Force Test

(5) Hardware Buckle Latch Test (maximum separation force of 22N)

(6) Loop Load Test (minimum loop load requirement)

(a) 22,241 N – Type 1

(b) 22,241 N – Type 2 (Pelvic)

(c) 13,345 N – Type 2 (Upper Torso)

(7) Elongation Test

(a) Maximum extension of assembly loop of 178 mm – Type 1

(b) Maximum extension of assembly loop of 508 mm – Type 2 (Pelvic or Upper Torso)

(8) Maximum Buckle Release Force

(a) 133 N – Type 1 and Type 2 assemblies

(9) Common Hardware Loop Load Test

(a) 26,689 N loop load (13,345 N tensile force) applied to hardware common to pelvic and upper torso portions of a Type 2 assembly

(10) Cut Webbing – Minimum Breaking Strength, if required

(a) 18,683 N – Type 1

(b) 15,569 N – Type 2 (Pelvic)

(c) 12,455 N – Type 2 (Upper Torso)

12. COMPLIANCE TEST EXECUTION....Continued

(11) Retractor Load Test

(a) Minimum Retractor Stitch Loop Load at 100% Extension

- 22,241 N – Type 1
- 22,241 N – Type 2 (Pelvic)
- 13,345 N – Type 2 (Upper Torso)

OR

(b) Minimum Tensile Load Test

- 11,120 N – T1 assembly
- 11,120 N – Type 2 (Pelvic)
- 6,672 N – Type 2 (Upper Torso)

D. RETRACTOR PERFORMANCE
GROUP D (Test Samples 10, 11 and 12)

(1) Baseline Test

(a) Conditioning

(b) Measurement of baseline values

- Lowest retraction force
- Webbing travel before lockup
- Angle no-lock check (15 degrees)

(2) Post Corrosion Cycling Test

(a) Corrosion Conditioning – salt chamber exposure for 24 hours

(b) Dry for one hour

12. COMPLIANCE TEST EXECUTION....Continued

(c) Wash

(d) Dry for 24 hours

(e) Inspection

(f) 25 manual cycles

(g) 2,500 cycles

(3) Post Temperature Cycling Test

(a) 80°C (176°F) Temperature for 24 hours over water AND

80°C (176°F) Temperature for 24 hours in dry oven

(b) 2,500 cycles

(4) Dust Test for 5 hours

(5) Additional Cycling

(a) 25 manual cycles

(b) Automatic cycling

- 5,000 cycles – ALR
- 45,000 cycles – ELR

NOTE: Of the 50,000 cycles performed in Tests (2), (3) and (5), on ELRs, 10,000 shall be lockup cycles.

(6) Post Test Retractor Performance Tests

(a) Lowest retraction force shall be not less than 50% of baseline value

(b) Webbing travel before lockup

(c) Angle no-lock check (15 degrees)

12. COMPLIANCE TEST EXECUTION....Continued

(7) Minimum Retractor Strength Test

(a) 22,241 N – Type 1

(b) 22,241 N – Type 2 (Pelvic)

(c) 13,345 N – Type 2 (Upper Torso)

TEST REQUIREMENTS

General Requirements

Inspect all hardware for burrs and sharp edges. Inspect each belt assembly release mechanism for possibility of accidental release and, if applicable, verify that the attachment hardware per SAE J800b is included. Inspect the ends of the webbing to ascertain that raveling will be prevented.

START GROUP A TEST SERIES
WEBBING ELONGATION AND BREAKING STRENGTH
TEST SAMPLES 1, 2 and 3

A.1 Webbing Width [S4.2(a), S5.1(a)]

Condition 3 webbing specimens for 24 hours at 23 ± 2°C and 48 percent to 67 percent relative humidity. Install each specimen in a tensile tester equipped with split grip webbing drums as shown in Figures 2 and 3. The webbing width is measured during the strength elongation pull. The tension during measurement of width shall be not more than 22 N on webbing from a Type 1 seat belt assembly and 9786 ± 450 N on webbing from a Type 2 seat belt assembly.

12. COMPLIANCE TEST EXECUTION....Continued

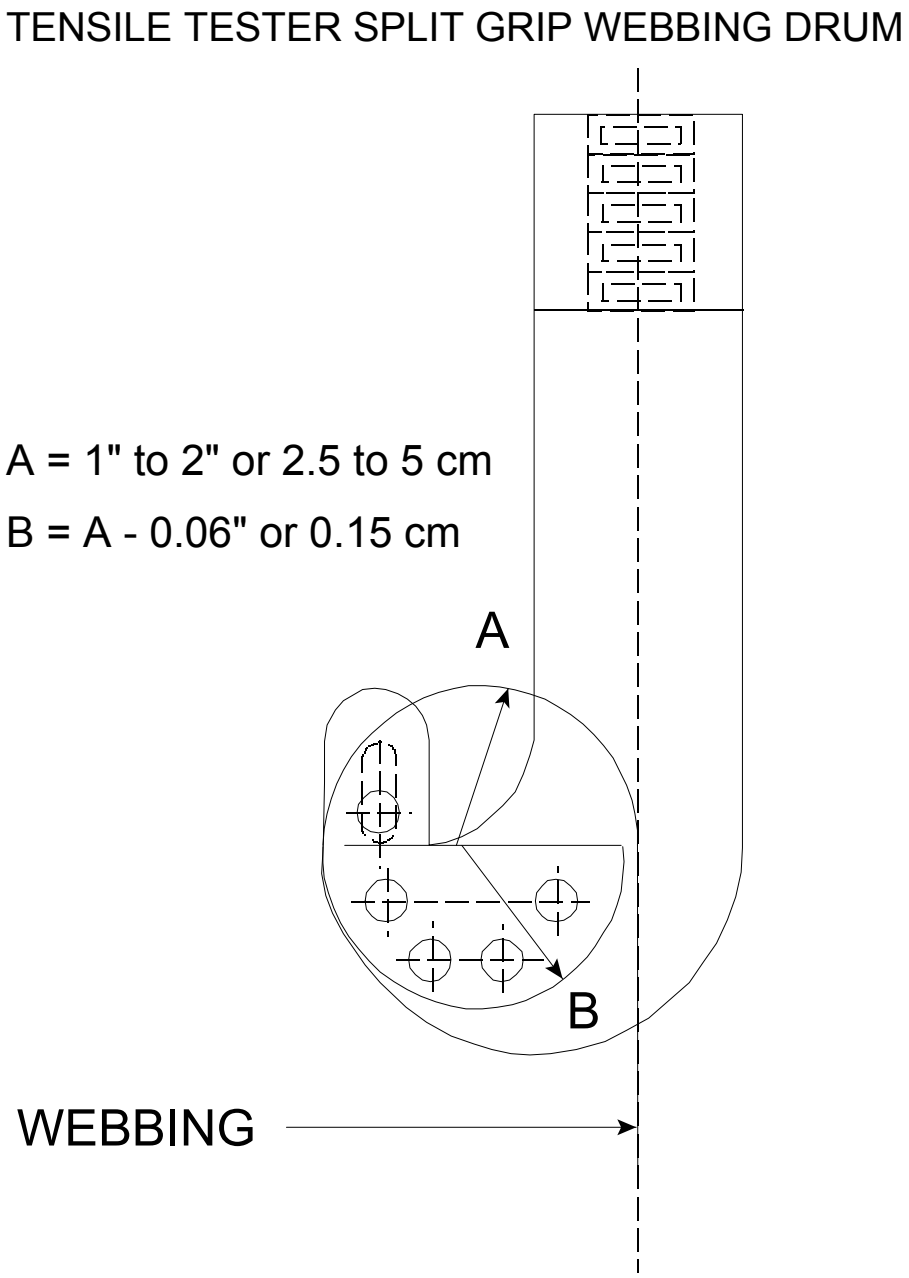


FIGURE 2

12. COMPLIANCE TEST EXECUTION....Continued

METHOD OF WRAPPING WEBBING SPLIT GRIPS

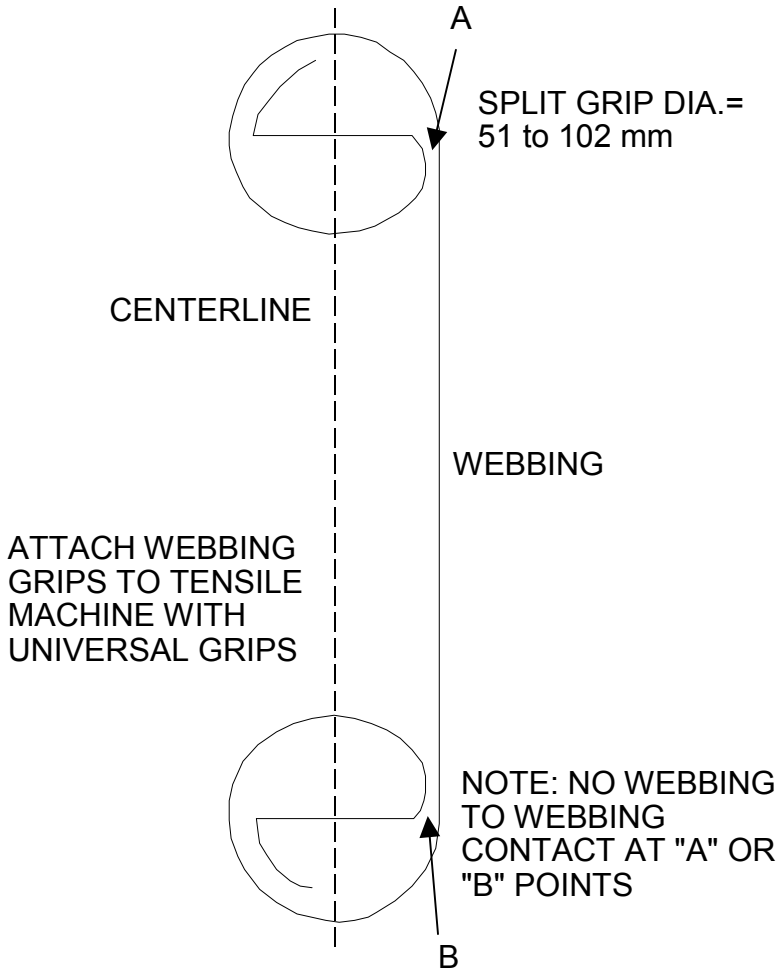


FIGURE 3

12. COMPLIANCE TEST EXECUTION....Continued

A.2 Webbing Elongation [S4.2(c), S5.1(c)]

As above, preload the webbing specimen to a value between 196 N and 245 N and attach an extensometer with a 101.6 mm, +.7938 mm, -0 mm (4 inch, +0.03125 inch, -0 inch), gage length. Apply the load at 51 and 102 mm per minute head separation. The webbing in a Type 1 seat belt assembly shall not elongate more than 20 percent at 11,120 N. The webbing in the pelvic portion of a Type 2 seat belt assembly shall not elongate more than 30 percent at 11,120 N. The webbing in the upper torso portion of a Type 2 seat belt assembly shall not elongate more than 40 percent at 11,120 N.

A.3 Webbing Breaking Strength [S4.2(b), S5.1(b)]

As above, stop the machine, remove the extensometer, and continue to load at 51 to 102 mm/minute to the ultimate breaking strength. Webbing failures occurring in a portion of the webbing which was in contact with the grips at the beginning of the test shall not be considered valid. Retest shall be required if jaw breaks occur.

A.4 Resistance to Light [S4.2(e), S5.1(e)]

Webbing samples at least 508 mm in length from three seat belt assemblies shall be suspended vertically on the inside of the specimen rack in a Type E carbon-arc light-exposure apparatus described in Standard Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials, ASTM Designation: G23-81, published by the American Society for Testing and Materials, except that the filter used for 100 percent polyester yarns shall be chemically strengthened soda-lime glass with a transmittance of less than 5 percent for wavelengths equal to or less than 305 nanometers and 90 percent or greater transmittance for wave lengths of 375 to 800 nanometers. The apparatus shall be operated without water spray at an air temperature of 60 ± 2°C measured at a point 25 ± 5 mm outside the specimen rack and midway in height. The temperature sensing element shall be shielded from radiation. The specimen shall be exposed to light from the carbon-arc for 100 hours and then conditioned as prescribed in paragraph A.1 of this section. The breaking strength of the specimens shall be determined by the procedure prescribed in paragraph A.3 of this section. The median values for breaking strengths determined on exposed and unexposed specimens shall be used to calculate the percentage of breaking strength retained. After exposure to light of a carbon arc, the webbing in a seat belt assembly shall have a median breaking strength not less than 60 percent of the median breaking strength and have a color retention of not less than Number 2 on the Geometric Gray Scale published by the AATCC.

12. COMPLIANCE TEST EXECUTION....Continued

A.5 Resistance to Micro-Organisms [S4.2(f), S5.1(f)]

Webbing samples at least 508 mm in length from three seat belt assemblies shall first be preconditioned in accordance with Appendix A (1) and (2) of American Association of Textile Chemists and Colorist Test Method 30-81, "Fungicides Evaluation on Textiles; Mildew and Rot Resistance to Test I, "Soil Burial Test" of that test method. After soil-burial for a period of 2 weeks, the specimens shall be washed in water, dried and conditioned as prescribed in paragraph A of this section. The breaking strengths of the specimens shall be determined by the procedure prescribed in paragraph A.3. The median values for the breaking strengths determined on exposed and unexposed specimens shall be used to calibrate the percentage of breaking strength retained. After being subjected to AATCC test method 30-81 for a period of 2 weeks, the webbing in a seat belt assembly shall have a breaking strength not less than 85 percent of the strength before subjection to micro-organisms.

NOTE: This test shall not be required on webbing made from material which is inherently resistant to micro-organisms.

START GROUP B TEST SERIES
WEBBING ABRASION
TEST SAMPLES 4, 5 and 6

B.1 Webbing Resistance to Abrasion Test [S4.2(d), S5.1(d) and S5.3(c)]

(a) Condition three (3) specimens as in paragraph A.1. Mount the specimens in the hex bar abrasion machine. If the assembly contains a manual adjusting device, it shall be subjected to the buckle abrasion test. The hex bar abrasion machine is shown in Figure 4. The buckle abrasion apparatus is shown in Figure 5.

(b) Abrasion Conditioning

Rotate the hex bar after each 2,500 cycles and use a webbing stroke of 330 ± 13 mm. Guides shall be provided to prevent movement of the webbing along the axis of the hex bar. These guides must not contact the webbing during the test. Oscillate the drum for 2,500 cycles (5,000 strokes) at a rate of 30 cycles, ± 1 cycle, per minute or 60 strokes,

12. COMPLIANCE TEST EXECUTION....Continued

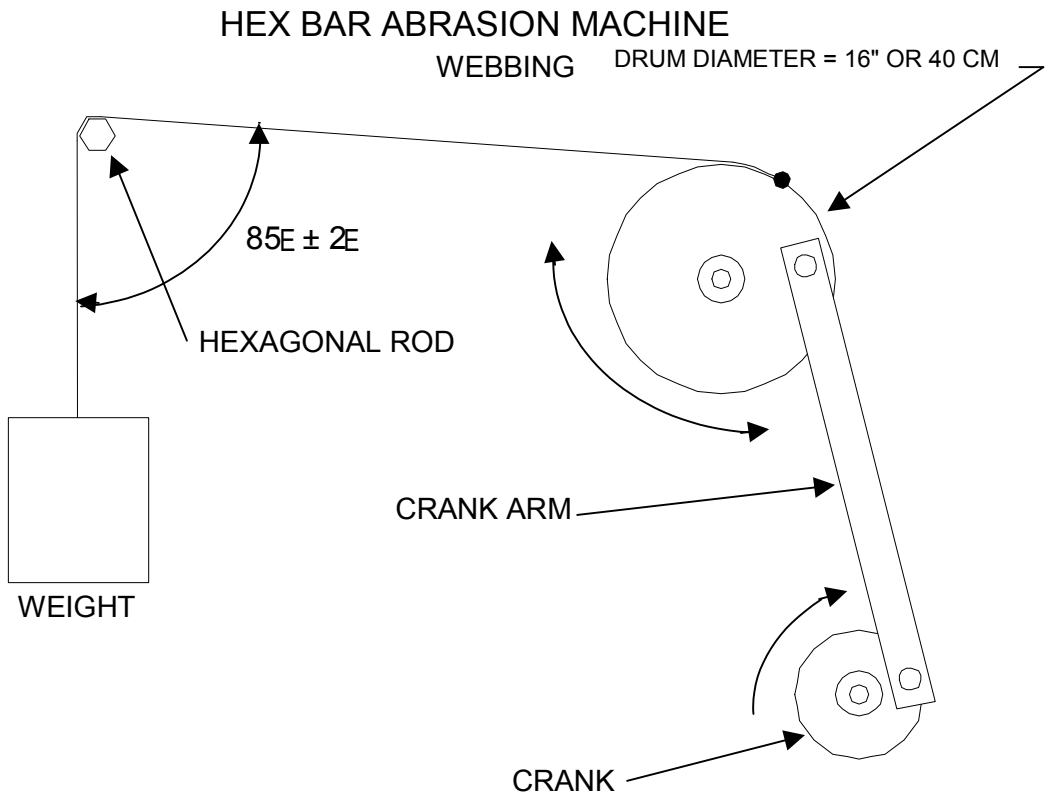


FIGURE 4

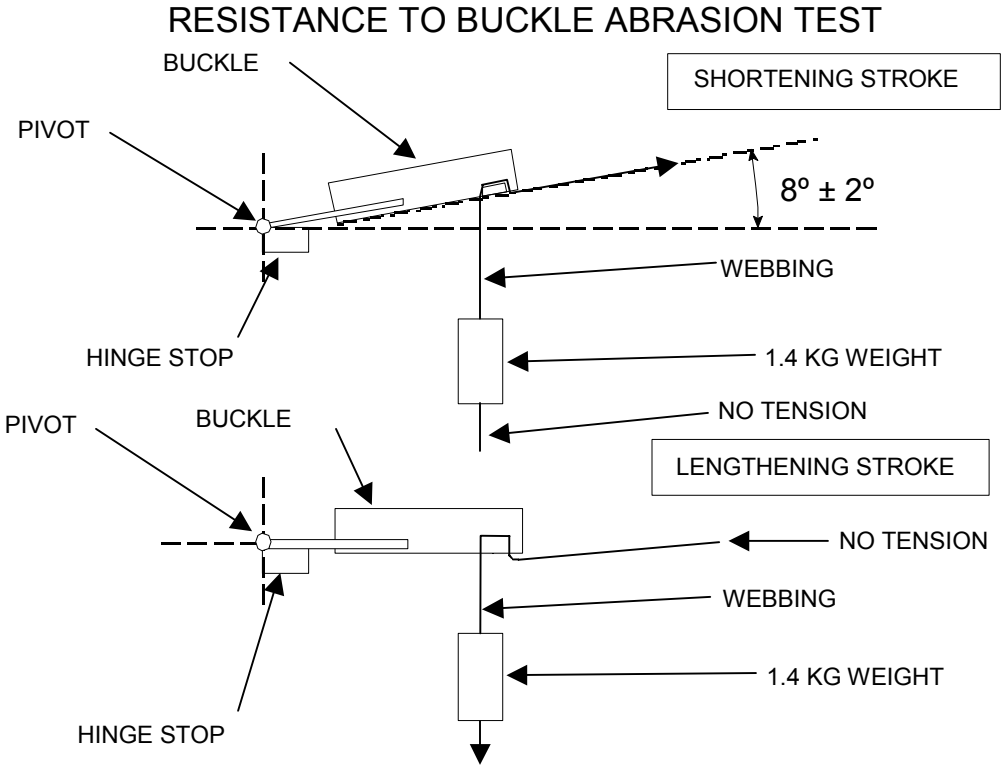


FIGURE 5

12. COMPLIANCE TEST EXECUTION....Continued

± 2 strokes, per minute. See Figure 5 for buckle abrasion information. Condition the webbing for 4 hours at 65 percent relative humidity and 18ºC. The reciprocating device shall be operated for 2,500 cycles at a rate of 18 cycles per minute with a stroke length of 203 mm. The resistance to abrasion is only a conditioning for the following.

(c) Webbing Breaking Strength After Abrasion Conditioning

After abrasion conditioning, install the test samples in a tensile testing machine equipped with split grip webbing drums as shown previously. Subject the 3 specimens to a breaking strength test by increasing the tension on the webbing at a grip separation rate of 51 and 102 mm, per minute.

For a Type 2 assembly, the minimum breaking strength shall be 16,681 N for the pelvic portion and 13,345 N for the upper torso portion.

START GROUP C TEST SERIES
HARDWARE AND ASSEMBLY PERFORMANCE
TEST SAMPLES 7, 8 and 9

HARDWARE PERFORMANCE TESTS

C.1 Hardware Corrosion Resistance [S4.3(a), S5.2(a)]

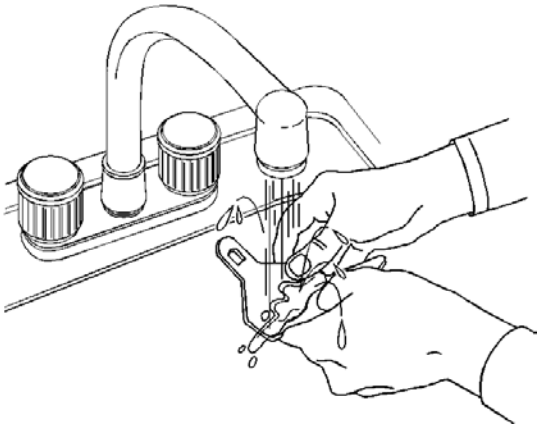
(a) Salt Spray Exposure

All hardware shall be subjected to a 24-hour exposure period in a salt spray chamber followed by a one-hour drying period. Any attachment hardware normally installed near the floor of a vehicle will be exposed to an additional 24-hour period followed by a one hour drying period. During the one hour drying period, the parts shall be at laboratory conditions. Following the salt spray exposure/drying cycle, follow Steps 1-3 below to wash the components thoroughly with water to remove the salt. After washing, follow Step 4 below to allow the specimens to dry for 24 hours under standard laboratory conditions specified in paragraph A.1.

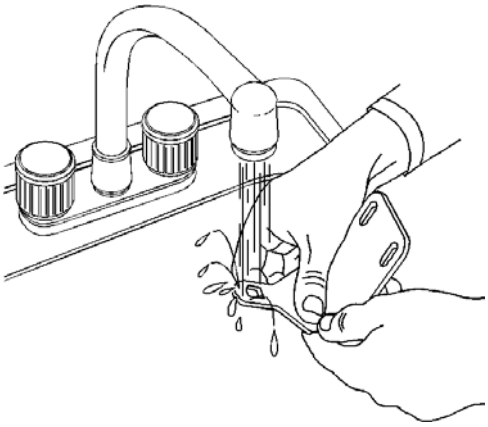
(1) Place component under running water at 38°C (100°F) ± 5°C (9°F).
(2) Thoroughly wash components lightly with fingers to remove salt from the surfaces. (Figure 6 illustrates the proper washing method)
(3) Turn component over and repeat Step #2.
(4) After thoroughly washing and before evaluation, allow components to dry for 24 hours under standard laboratory conditions as stated in A-1.

12. COMPLIANCE TEST EXECUTION....Continued

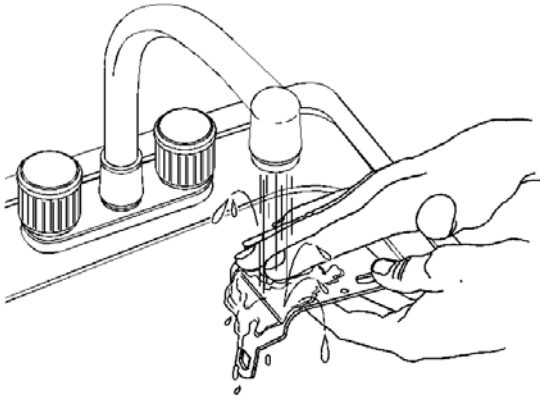
Follow steps 1-4 to wash thoroughly.



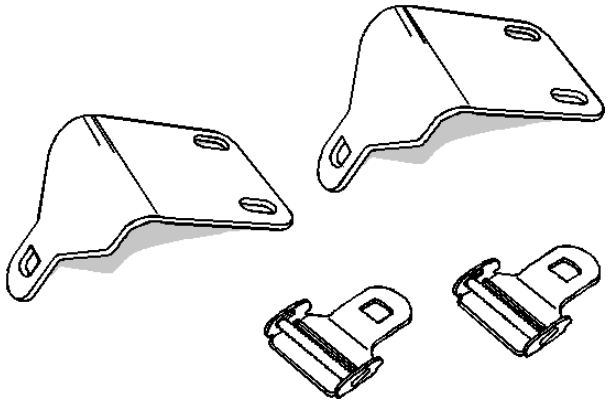
1. Place component under running water at 38°C (100°F) +/- 5°C (9°F).



2. Thoroughly wash while holding under running water. Rub component lightly with fingers to remove salt.



3. Turn component over and repeat step #2.



4. After thoroughly washing, allow to dry for 24 hours before evaluation.

FIGURE 6

12. COMPLIANCE TEST EXECUTION....Continued

(b) Salt Spray System Test Setup

The analysis and calibration aspects of the salt spray system shall be in accordance with ASTM Procedure B117-73 entitled "Standard Method of Salt Spray (Fog) Testing." Prepare a salt solution by dissolving 5 parts, ± 1 part, of salt by weight in 95 parts of distilled water. The Ph range of the mixture shall be within 6.5 and 7.2. The compressed air supply to the nozzles will be maintained between 69 and 172 kN/m^2 (10 and 25 psig). Suspend or support the specimens between 15 and 30 degrees from the vertical and preferably parallel to the principal direction of horizontal flow of fog through the chamber. Buckles must be unlatched. Ensure that the specimen surfaces do not contact each other and direct the nozzles so that none of the spray can impinge directly on the specimens. Salt solution from one specimen shall not be allowed to drip on any other specimen.

(c) Inspection Of Assemblies

At the conclusion of the 24 hour drying period, the hardware from 3 test samples shall be inspected. The significant surfaces of the hardware shall be free of ferrous or nonferrous corrosion that may be transferred, either directly or by means of the webbing, to the occupant or his/her clothing. The interpretation of “free of corrosion” on exposed significant surfaces is that the size of any corrosion spot must not extend outside of a 6 mm diameter gage pin. (The technician making the evaluation must be aware of the component’s position on the seat belt assembly to be able to determine if corrosion can be transferred to the webbing or come in contact with the occupant.) Examine the hardware for such corrosion and record the results on the appropriate data sheet.

C.2 Hardware Temperature Resistance [S4.3(b), S5.2(b)]

Plastic or other nonmetallic parts of 3 specimens shall be subjected to the temperature resistance test and shall not warp or otherwise deteriorate. Condition 3 specimens as in paragraph A.1 and then expose the assemblies to a temperature of 80 ± 1°C (176 ± 1.8°F), for 24 hours in a circulating air type oven in accordance with ASTM D756-78, Procedure D. The first 24 hour period will be a humid exposure, and then, the 3 specimens will be subjected to a second 24 hour period of dry heat at 80 ± 1°C (176 ± 1.8°F) in accordance with ASTM D756-78, Procedure D.

C.3 Attachment Hardware [S4.3(c), S5.2(c)]

Attachment bolts used to secure the pelvic restraint shall be tested in a manner similar to that shown on the next page. A bolt from each of 3 seat belt assemblies shall be tested.

12. COMPLIANCE TEST EXECUTION....Continued

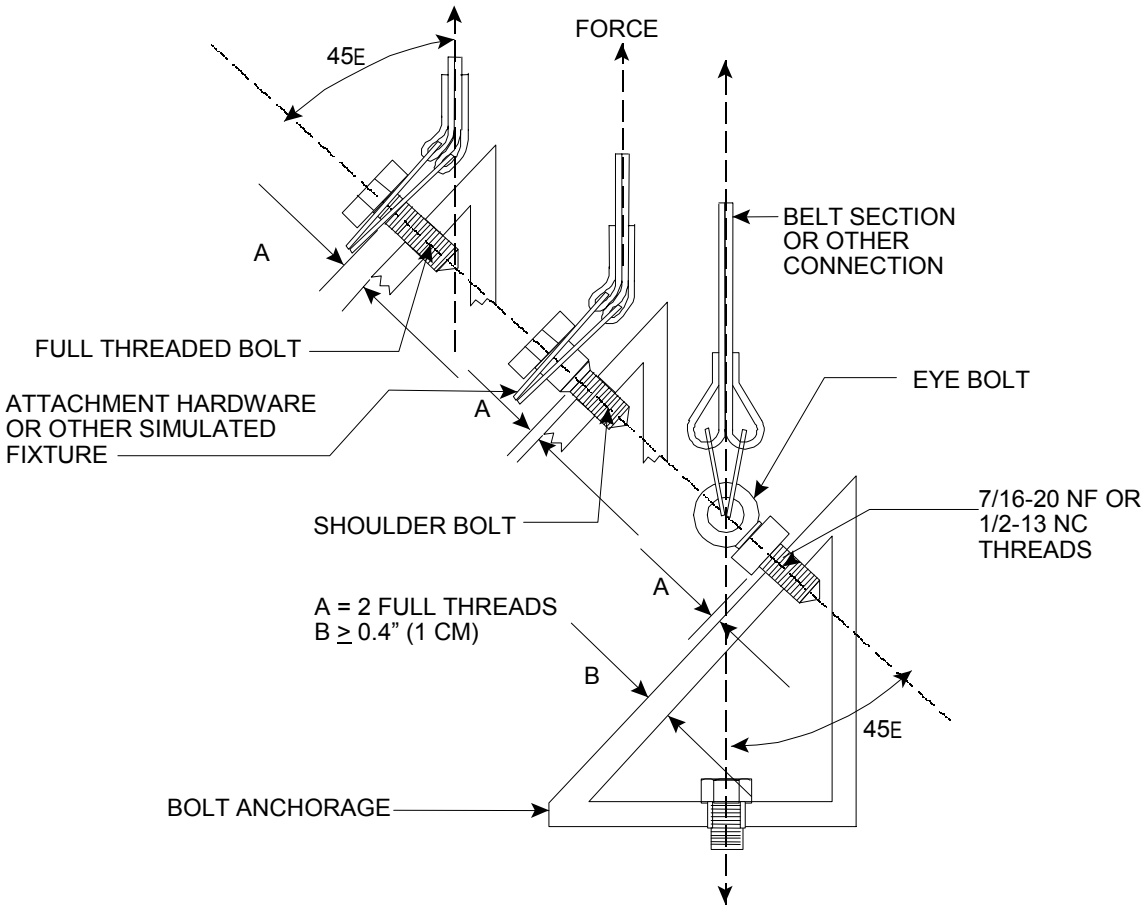


FIGURE 7

12. COMPLIANCE TEST EXECUTION....Continued

Attachment hardware, other than bolts, designed to receive the ends of 2 seat belt assemblies shall be subjected to a tensile force of 26,689 N in a manner simulating use. Attachment hardware from 3 seat belt assemblies shall be tested.

C.4 Adjustment Force [S4.3(e), S5.2(e)]

Any manual adjusting device used to adjust the size of the seat belt assembly shall be tested for adjustment force. With no load on the anchor end, draw the webbing through the adjusting device at a rate of 508 ± 50 mm/min. Measure the maximum force needed to adjust the size of the assembly to the nearest 1 N after the first 25 mm of webbing movement. Precycle the webbing 10 times prior to measurement. The maximum adjustment force needed to adjust (decrease) the size of the assembly shall not exceed 49 N.

C.5 Hardware Buckle Latch [S4.3(g), S5.2(g)]

A buckle latch from 3 specimens shall be subjected to test. The buckles shall not fail, gall or wear to an extent that normal latching and unlatching is impaired. A metal-to-metal buckle shall separate in any position of partial engagement by a force of not more than 22 N. Withdraw the webbing from a metal-to-webbing buckle and open and close the buckle 10 times. Secure the actuator of a cycling device to the buckle latch. Prior to securing the latch to the actuator, adjust the cycling machine to produce a force of 133 ± 13 N, and a cycling rate not to exceed 30 cycles per minute. Move the latch 200 times through the maximum possible travel against its stop.

ASSEMBLY PERFORMANCE TESTS

The test will normally be conducted as a loop load with the D ring included in the loop to simulate, as close as possible, its position relative to the seat belt anchorages in the vehicle installation.

The length of webbing on the retractor spool during the loop load test will be representative of that which would be on the spool when the seat belt assembly is being used by a 50th percentile adult male. These lengths will be supplied by the COTR.

12. COMPLIANCE TEST EXECUTION....Continued

The length of webbing on the retractor spool shall be recorded on the data sheet.

If the 1220 to 1270 mm loop (specified in FMVSS 209, S5.3(b)(1)) cannot be attained when the required webbing length is wrapped around the retractor spool, the excess webbing will be clamped in order to attain the correct loop size. This webbing will be clamped out of the system and remain as slack throughout the loop load test.

If the loop load test cannot be effectively performed on the seat belt assemblies due to complexity of seat belt design or other reasons, a series of component tensile strength tests will be conducted to include the anchorages, buckles, D rings, and retractors. This procedure shall be followed ONLY with the approval of the COTR.

When a failure occurs during the three-phase test sequence on the seat belt assembly in a phase that had undergone a previous stress test (i.e., buckle failing 26,689 N common hardware test after passing 22,241 N loop load test) the failed test will be repeated on new hardware with the first failure discounted.

If any failure occurs during the assembly performance test, the COTR will be contacted immediately and all compliance testing stopped on the seat belt assemblies. Testing will be resumed on these assemblies only on approval of the COTR.

The buckles (Group C) will be subjected to environmental stress testing separately with the functional tests (i.e., buckle latch, cycling, false latching, etc.) conducted on these samples.

The buckles will be unlatched during the corrosion test.

The buckle release force test will be conducted on the three assemblies after the loop load test NOT on the environmentally stressed buckles.

12. COMPLIANCE TEST EXECUTION....Continued

Loop Load Test Setup

Condition 3 specimens as in paragraph A.1 and attach a double-roller block and anchorage bar to the heads of the tensile machine as shown in Figures 8, 9, 10 and 11. Position the webbing loop on the roller fixture and attach the ends to the adapter fixtures to form an angle closest to 90 degrees, or the closest angle to approximate in-vehicle installation, between the webbing and the laced end of the attachment hardware. Position the buckle so that it does not contact the rollers during the test. Lock the ALR or ELR units and apply a 245 N load. Reduce the load to zero and adjust the loop length to be between 1220 to 1270 mm, if possible. Apply a 89 to 98 N load, synchronize the recording chart and head speed, and apply the load required at 51 to 102 mm per minute.

12. COMPLIANCE TEST EXECUTION....Continued

T1 ASSEMBLY TEST SETUP

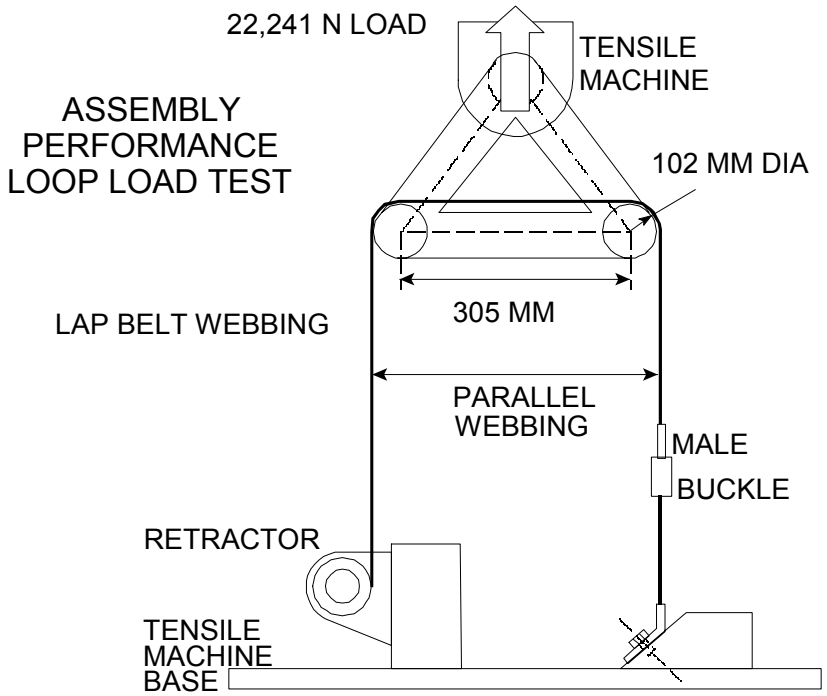


FIGURE 8

T2 SEAT BELT ASSEMBLY, PELVIC RESTRAINT TEST SETUP

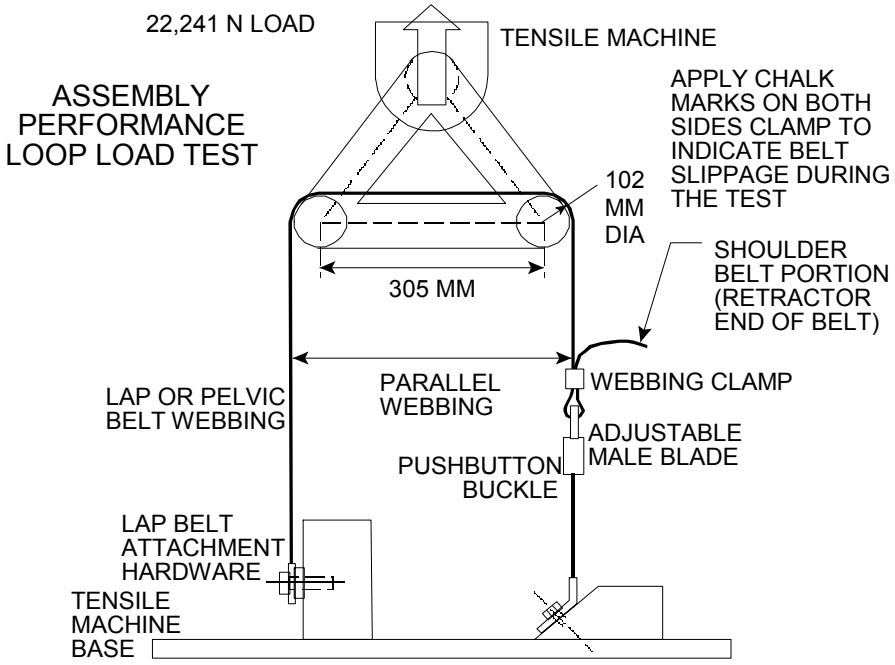


FIGURE 9

12. COMPLIANCE TEST EXECUTION....Continued

T2 SEAT BELT ASSEMBLY, UPPER TORSO RESTRAINT
TEST SETUP

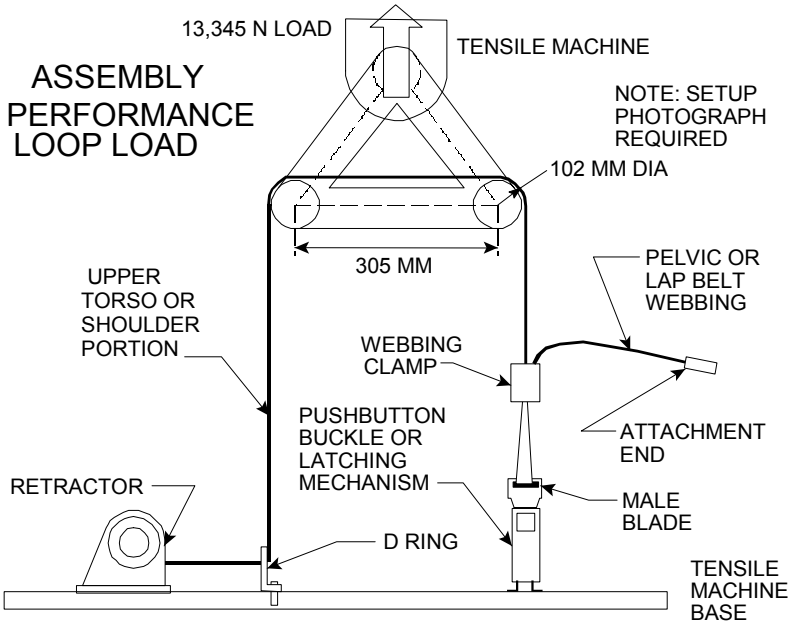


FIGURE 10

COMMON HARDWARE TEST SETUP

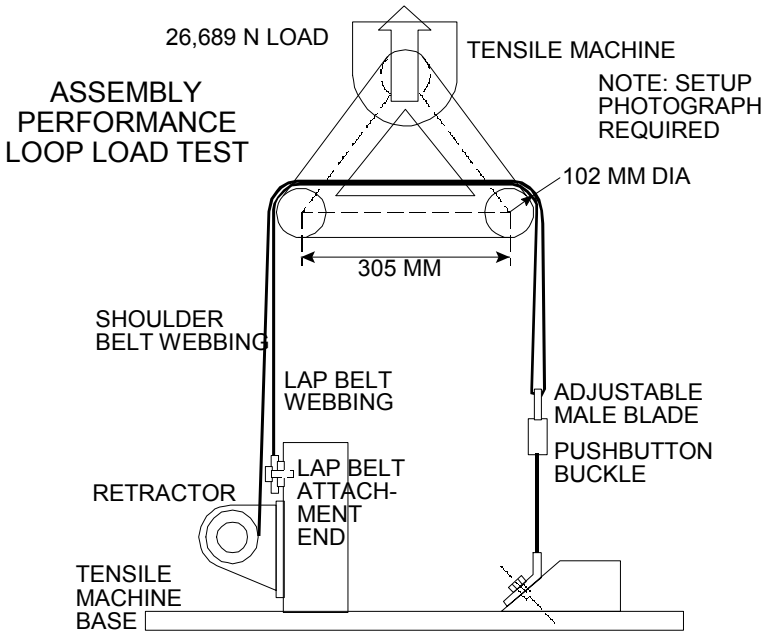


FIGURE 11

12. COMPLIANCE TEST EXECUTION....Continued

C.6 Loop Load Test [S4.4(a)(b), S5.3(a)(b)]

For a Type 1 assembly, apply a loop load of 22,241 N (11,120 N tensile load) using the test setup shown in Figure 8. All structural components shall withstand a minimum force of 11,120 N.

For the pelvic portion of a Type 2 assembly, apply a loop load of 22,241 N (11,120 N tensile load) using the test setup shown in Figure 9. All structural components shall withstand a minimum force of 11,120 N.

For the upper torso portion of a Type 2 assembly, apply a loop load of 13,345 N (6,672 N tensile load) using the test setup shown in Figure 10. All structural components shall withstand a minimum force of 6,672 N.

C.7 Elongation Test

Elongation shall be measured while performing Test C.6, Loop Load.

For a Type 1 assembly, measure the loop length when a 22,241 N loop load is achieved. The assembly loop shall extend no more than 178 mm (356 mm between anchorages).

For the pelvic portion of a Type 2 assembly, measure the loop length when a 22,241 N loop load is achieved. The assembly loop shall extend no more than 254 mm (508 mm between anchorages).

For the upper torso portion of a Type 2 assembly, measure the loop length when a 13,344 N loop load is achieved. The assembly loop shall extend no more than 254 mm (508 mm between anchorages).

C.8 Buckle Release Force Test [S4.3(d), S5.3(b)(2)]

After each elongation test, reduce the loop load to 667 N (334 ± 22 N force on buckle), back the pushbutton buckle with a rigid fixture to prevent movement, and apply a release force with a direct readout force gage. The release force shall be applied in a manner and direction typical of that which would be employed by a seat belt occupant. Maximum buckle release force shall not exceed 133 N.

12. COMPLIANCE TEST EXECUTION....Continued

C.9 Common Hardware Load Test [S4.4(b)(3), S5.3(b)(3)]

Use the same 3 test samples to perform the 26,689 N (13,344 ± 134 N force on common hardware), loop load test for common structural components. See the test setup shown in Figure 11.

C.10 Cut Webbing Breaking Strength Test [S4.4(b)(6), S5.3(b)(4)]

If the webbing is cut for a distance of 10 percent or more of its width, the test sample shall be tested for breaking strength as in paragraph A.3. The portion of the webbing at the cut point shall have a breaking strength of not less than 15,569 N for a pelvic restraint, or not less than 12,455 N for an upper torso restraint.

C.11 Retractor Load Test [S5.3(b)(5)]

Fully extend the webbing from the ALR or ELR and apply a loop load of 22,241 N (11,120 N tensile force), (pelvic) or a 13,344 ± 134 N loop load (6,672 ± 67 N tensile force), (upper torso and continuous webbing systems).

START GROUP D TEST SERIES
RETRACTOR PERFORMANCE
TEST SAMPLES 10, 11 and 12

Retractor Performance Tests

The retractor cycling testing on ALRs and ELRs will be conducted as presently specified with the following additional requirements:

The cycling rate for each retractor will be recorded on the data sheet.

The retractors that operate erratically on the cycling apparatus will be immediately removed and placed in a conditioned environment for testing at a later time so as not to delay the program.

The time period between environmental stress and initiation of retractor cycling shall be kept to a minimum in accordance with good engineering practice.

The retractors undergoing environmental stress testing will be oriented in the chamber to simulate their installation position in the vehicle.

12. COMPLIANCE TEST EXECUTION....Continued

The retractor configurations that cannot be tested using the present test equipment and fixtures without destroying the integrity of the test specimen will be put aside for consultation with the COTR. These retractors shall not be tested until a specific procedure is developed for each retractor.

Both the environmental and non-environmental cycling tests will be performed as specified in the contract.

The retractor acceleration test will be conducted as presently specified with the following additional requirements:

There will be no excessive noise in the acceleration vs. time (a-t) trace.

The retractor shall be accelerated three times to lockup at 0.7g prior to conducting the test for recording purposes.

If a retractor fails the 0.7g acceleration test, 10 retests will be conducted on that retractor and recorded in the test report on a supplementary data page as retests.

The level will be increased in 0.1g increments to determine a level at which the retractor functions if no lockup is achieved in the previous item above. This will be recorded on the data sheet.

D.1 Baseline Tests

Condition 3 specimens as in paragraph A.1, and then mount the units as shown in Figure 12.

For Automatic Locking Retractors (ALR) Units [S4.3(i), S5.2(i)]

Extend the webbing fully and mark the 75 percent extension point and at ± 51 mm. After extending and retracting the webbing fully 10 times, attach a force gage per the figure on the next page and take force readings at the 75 percent +51 mm, 75 percent, and 75 percent –51 mm extension lines. The retraction force will be the AVERAGE of the 3 values. Now lock the ALR near the 75 percent line and mark the webbing. Unlock the ALR and extend the webbing to the next locking position. Measure the webbing travel with respect to the first locking position.

12. COMPLIANCE TEST EXECUTION....Continued

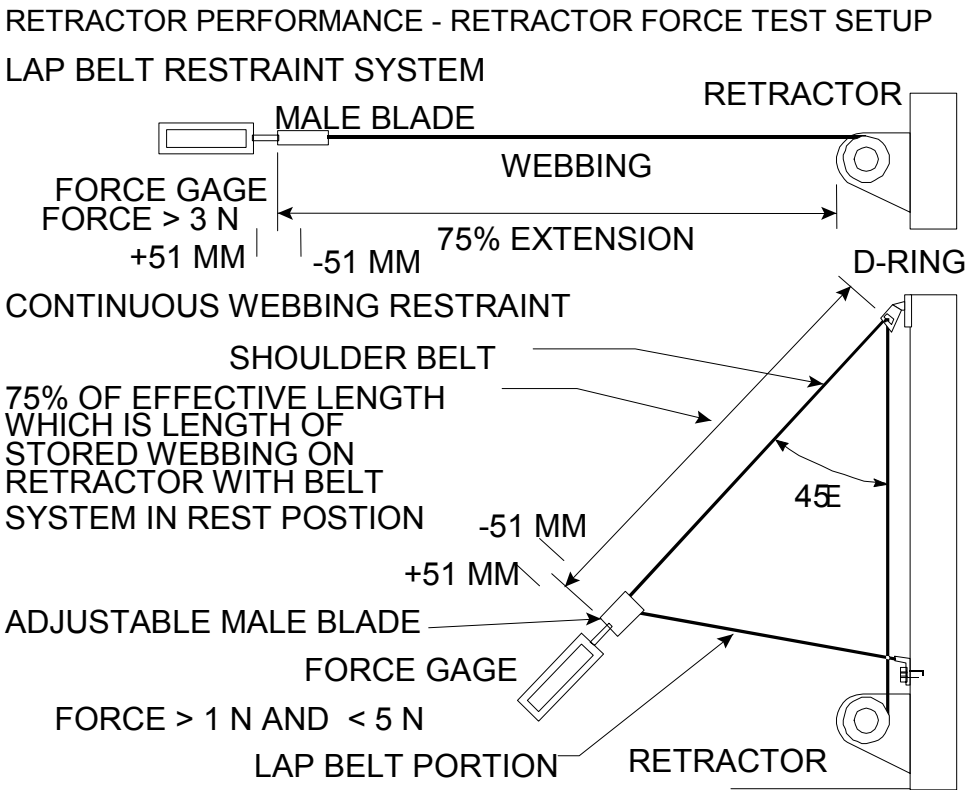


FIGURE 12

For Emergency Locking Retractors (ELR) Units [S4.3(j), S5.2(j)]

Extend the webbing fully and mark the 75 percent +51 mm extension point and the 75 percent –51 mm extension point. In the case of continuous webbing systems, the "effective length" (length of stored webbing in vehicle at rest position) will be used to determine the 75 percent point. While the webbing is being retracted, the LOWEST force of retraction within ± 51 mm of the 75 percent point shall be determined. Now mount each of the 3 ELR units in an acceleration apparatus.

FOR WEBBING SENSITIVE INERTIAL ELRs:

Each ELR shall be subjected to an acceleration of 0.28g within 50 milliseconds (ms), while the webbing is at 75 percent extension and shall not lockup before the webbing travels 25 mm. Each ELR shall also be subjected to an acceleration of 0.72g within 50 ms, and must lockup while the webbing is at 75 percent extension and travels not more than 25 mm. These accelerations must be done in the direction of webbing retraction while the retractor reel axis is oriented at various angles to the horizontal plane as shown in Figure 13.

12. COMPLIANCE TEST EXECUTION....Continued

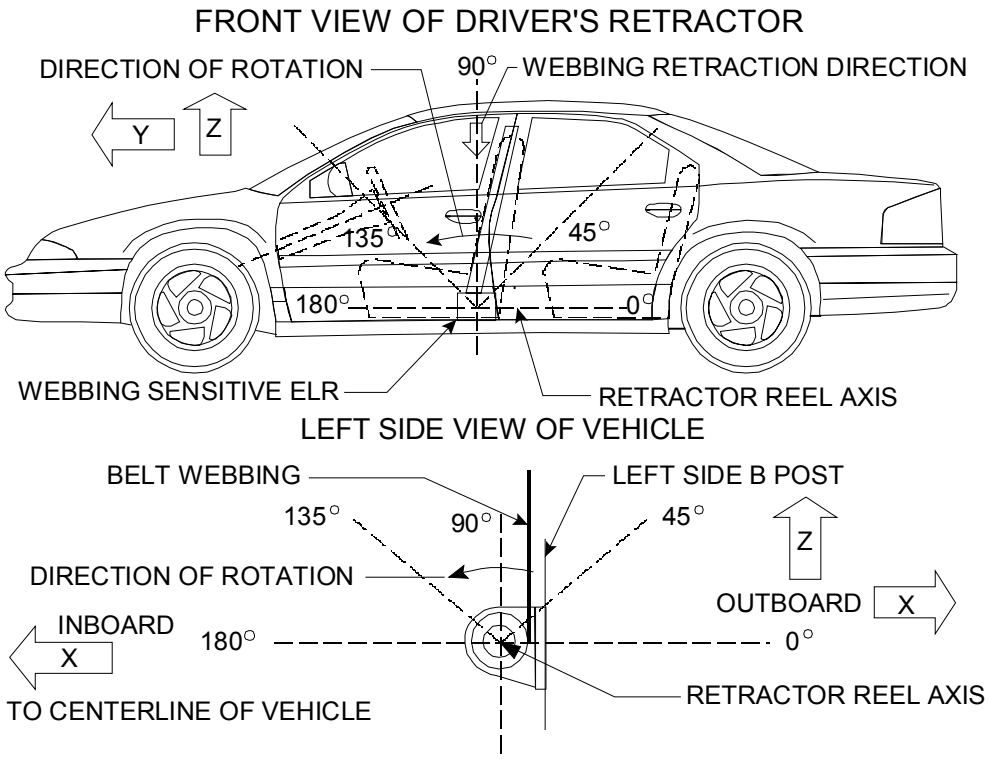


FIGURE 13

FOR VEHICLE SENSITIVE INERTIAL ELRs

Each ELR shall be subjected to an acceleration of 0.72g within 50 ms, and must lockup while the webbing is at 75 percent extension and travels not more than 25 mm. These accelerations must be done on the retractor in the horizontal plane in two directions normal to each other while the retractor reel axis is oriented at the angle at which it is installed in the vehicle as shown in Figure 13. Accelerate and lock each ELR unit three times immediately prior to test and then record the "g" value and distance traveled.

In addition, accelerate the retractor in three directions normal to each other while the retractor reel axis is oriented at various angles from the angle at which it is installed in the vehicle as shown on the previous page UNLESS the retractor locks by gravitational force when tilted in any direction to any angle greater than 45° from the angle at which it is installed in the vehicle. The 0° line will always be the retractor reel axis or centerline when the ELR is in the vehicle installed position.

D.2 Post Corrosion Cycling Test (2,500 cycles) [S5.2(k)]

Expose the same three retractor units to corrosion conditioning. Suspend units in the salt chamber so that cupping of saline solution is minimized. After 24 hour period, fully

12. COMPLIANCE TEST EXECUTION....Continued

extend the webbing and allow to dry at laboratory conditions for one hour. The post corrosion test washing technique for retractors is as follows:

Perform 4 wash cycles with the retractor mounted to a fixture to allow webbing extraction and retraction.

One wash cycle shall consist of the following:

(a) Totally immerse the retractor assembly in 38 ± 5ºC (100 ± 9ºF) water.

(b) Activate the retractor unit 3 times by fully extending the webbing from the retractor reel.

(c) Remove the assembly from the water bath and drain as much water from the retractor as possible while activating the retractor unit by fully extending the webbing from the retractor reel 3 times.

(d) Completely change the water after the retractors in a test set, a maximum of 3 retractors, have completed a wash cycle.

After washing, fully extend the webbing from each unit and allow to dry at 23 ± 2ºC and 48% to 67% humidity for 24 hours. Examine for ferrous and non-ferrous corrosion. Do not remove retractor unit end covers which might expose the spring or locking mechanism. All cover removal will be performed by the COTR. Extend and retract webbing 25 times and then subject the units to 2,500 cycles while applying a force of 89 N at full webbing extension.

12. COMPLIANCE TEST EXECUTION....Continued

D.3 Post Temperature Cycling Test (2,500 cycles)

Subject the same three specimens to 24 hours of 80 ± 1ºC (176°F, ± 1.8°F) over water and 24 hours of 80 ± 1ºC (176°F, ± 1.8°F) in a dry oven. Extend and retract the webbing 25 times and then subject the units to 2,500 cycles.

D.4 Dust Test

Install the same three specimens in a dust chamber as shown in Figure 15.

The chamber will contain .9 kg of coarse grain dust. Extend the webbing to the top of the chamber. Subject each retractor to a five hour test agitating the dust every 20 minutes, for a period of five seconds by using compressed air (550 ± 55 kPa) entering through an orifice with a diameter of 1.5 ± 0.1 mm. Within 1 or 2 minutes after each agitation of dust, cycle the units 10 times by extending the webbing to the top of the chamber and retracting it. After cycling, return the webbing to the top of the chamber.

Even though the amount of webbing on the retractor reel greatly exceeds the 508 mm cycle space in the dust chamber, an extension and retraction distance of 508 mm will be acceptable since it is not desirous to use a combination of pulleys inside of the dust chamber to gain more webbing extension.

D.5 Additional Cycling (5,000 or 45,000)

After removing the 3 specimens from the dust chamber, retract and extend the webbing fully 25 times. Then subject the three specimens to 5,000 cycles at 100 percent extension (or the "effective length" as in the case of continuous webbing systems) with a 89 N load for ALR units, and 45,000 cycles at 50 percent to 100 percent extension with a 89 N load for ELR units. Of the total 50,000 cycles for ELR units (5,000 + 45,000), 10,000 of them will be lockup cycles between 50 percent and 100 percent extension with a 89 N load. The lockup cycles can occur at the beginning or end of the 50,000 cycles or can be performed every fifth cycle depending on the laboratory test setup.

D.6 Post Test Retractor Characteristics Test [S4.3(k)]

(a) Retest the same three specimens as in paragraph D.1. The retraction force must be at least 50 percent of that observed in the original baseline test.

12. COMPLIANCE TEST EXECUTION....Continued

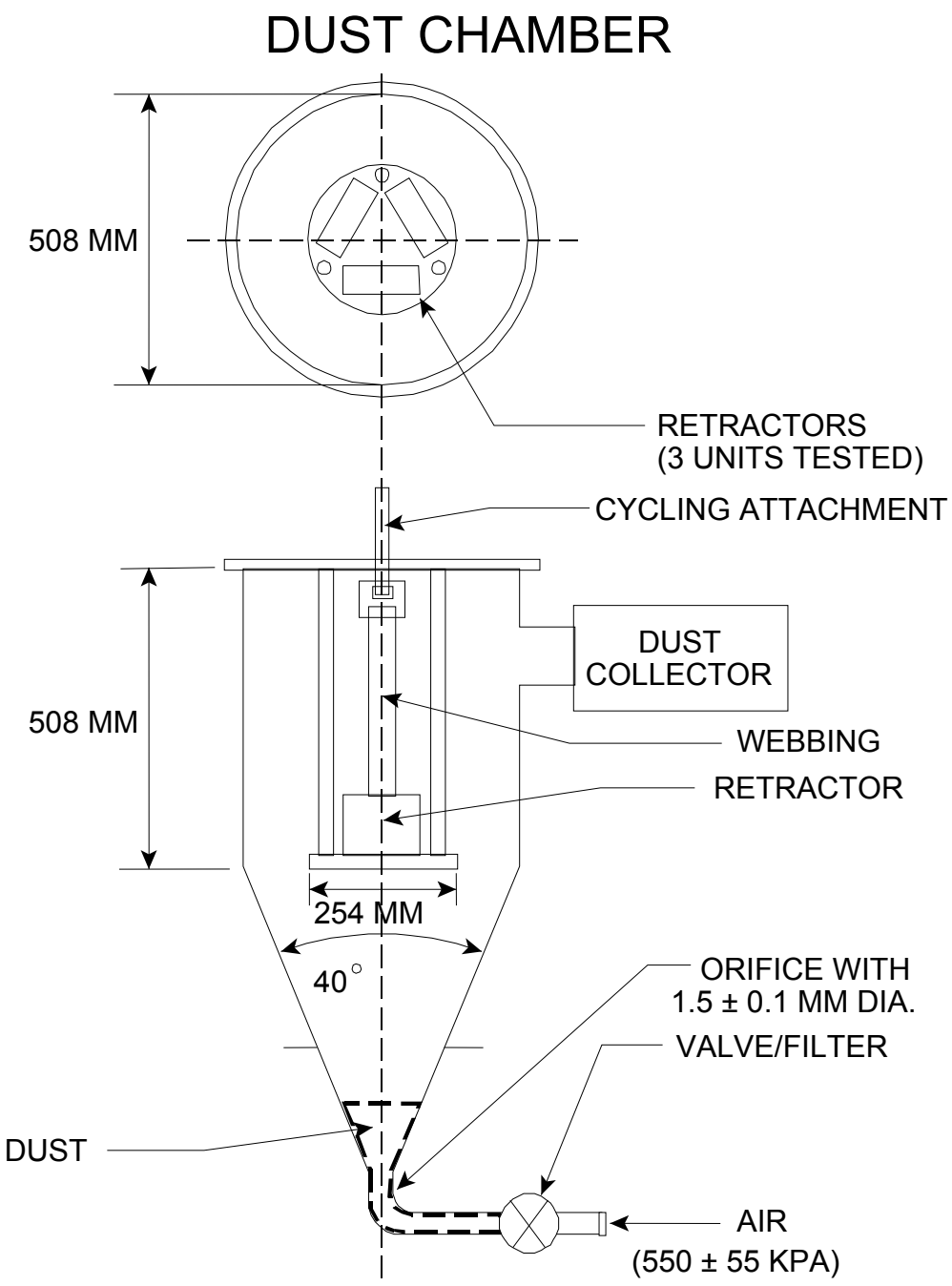


FIGURE 15

12. COMPLIANCE TEST EXECUTION....Continued

(b) Retraction Force Test

(1) The retraction force test will be conducted with the seat belt assembly oriented in such a way as to simulate as close as possible the installation position in the vehicle, including all auxiliary hardware.

(2) The test will be conducted with the male buckle blade removed from the webbing.

D.7 Retractor Performance -- Strength Test [S4.3(k)]

Perform a loop load test on the same three specimens with the retractors locked to simulate a 1295 mm loop or the largest loop possible if less than 1295 mm. Apply a loop load of 22,241 ± 222 N for a pelvic belt retractor, and a loop load of 13,344 ± 134 N for an upper torso belt retractor or the retractor of a continuous webbing system.

13. POST TEST REQUIREMENTS

The contractor shall re-verify all instrumentation and check data sheets and photographs. Make sure data is recorded in all data blocks on every compliance test data sheet.

Test items which have “passed” compliance requirements, and also any unused test items, shall be stored at no additional cost until receipt of disposition instructions from the COTR after all testing, inspection and acceptance of the Final Test Report.

14. REPORTS

14.1 MONTHLY STATUS REPORTS

The contractor shall submit a monthly report to the COTR. A sample of this report is shown on pages 6 and 69.

14.2 APPARENT NONCOMPLIANCE

Any indication of a test failure shall be communicated by telephone to the COTR within 24 hours with written notification mailed within 48 hours (Saturdays and Sundays excluded). A Notice of Test Failure (see report forms section) with a copy of the particular compliance test data sheet(s) and preliminary data plot(s) shall be included.

In the event of a test failure, a post test calibration check of some critically sensitive test equipment and instrumentation may be required for verification of accuracy. The necessity for the calibration shall be at the COTR's discretion and shall be performed without additional costs to the OVSC.

14. REPORTS...Continued

Test items which have “failed” compliance requirements and any unused test items identical to test items which have “failed” compliance requirements, shall be stored by the contractor for at least 2 years after the test failure at no additional cost, unless directed by the COTR to do otherwise.

In the case of a test failure, all test equipment and instrumentation used during testing must be maintained in the same configuration and condition as during the test, or be capable of being readily returned to that same configuration and condition, until a final determination of “passed” or “failed” has been made by the COTR. Furthermore, in the case of a test failure, any test equipment components which are replaced after each test must be clearly labeled and stored in a clean, dry location and maintained at normal room temperature until a final determination of “passed” or “failed” has been made by the COTR.

The final determination of “passed” or “failed” shall be made by the COTR upon acceptance of the Final Test Report. Therefore, no test items shall be destroyed or disposed of until authorized by the COTR.

14.3 FINAL TEST REPORTS

14.3.1 COPIES

In the case of a test failure, SEVEN copies of the Final Test Report shall be submitted to the COTR for acceptance within three weeks of test completion. The Final Test Report format to be used by all contractors can be found in the "Report Section."

Where there has been no indication of a test failure, FOUR copies of each Final Test Report shall be submitted to the COTR within three weeks of test completion. Payment of contractor's invoices for completed compliance tests may be withheld until the Final Test Report is accepted by the COTR. Invoices shall not be submitted prior to submission of the Final Test Report.

Contractors are required to PROOF READ all Final Test Reports before submittal to the COTR. The OVSC will not act as a report quality control office for contractors. Reports containing a significant number of errors will be returned to the contractor for correction, and a "hold" will be placed on invoice payment for the particular test.

14.3.2 REQUIREMENTS

The contractor should use DETAILED descriptions of all compliance test events. Any events that are not directly associated with the standard but are of technical interest should also be included. The contractor should include as much DETAIL as possible in the report.

Instructions for the preparation of the first three pages of the final test report are provided below for the purpose of standardization.

14. REPORTS...Continued

14.3.3 FIRST THREE PAGES

A. FRONT COVER

A heavy paperback cover (or transparency) shall be provided for the protection of the final report. The information required on the cover is as follows:

(1) Final Report Number such as 209-ABC-20XX-001, where —

209 is the FMVSS tested
ABC are the initials for the laboratory
20XX is the Fiscal Year of the test program
001 is the Group Number (001 for the 1st test, 002 for the 2nd test, etc.)

(2) Final Report Title And Subtitle such as

SAFETY COMPLIANCE TESTING FOR FMVSS 209
Seat Belt Assemblies
* * * * * * * * * * * * * * * * * *
World Motors Corporation
20XX Ace Super Coupe
AutoKraft Seat Belt Assembly P/N 12345678

(3) Contractor's Name and Address such as

COMPLIANCE TESTING LABORATORIES, INC.
4335 West Dearborn Street
Detroit, Michigan 48090-1234

NOTE: DOT SYMBOL WILL BE PLACED BETWEEN ITEMS (3) AND (4)

(4) Date of Final Report completion

(5) The words "FINAL REPORT"

(6) The sponsoring agency's name and address as follows

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance
400 Seventh Street, SW
Room 6111 (NVS-220)
Washington, DC 20590

14. REPORTS....Continued

B. FIRST PAGE AFTER FRONT COVER

A disclaimer statement and an acceptance signature block for the COTR shall be provided as follows:

This publication is distributed by the U. S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared By: _____

Approved By: _____

Approval Date: _____

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By:_____

Acceptance Date: _____

14. REPORTS....Continued

C. SECOND PAGE AFTER FRONT COVER

A completed Technical Report Documentation Page (Form DOT F1700.7) shall be completed for those items that are applicable with the other spaces left blank. Sample data for the applicable block numbers of the title page follows.

Block 1 -- REPORT NUMBER

209-ABC-20XX-001

Block 2 -- GOVERNMENT ACCESSION NUMBER

Leave blank

Block 3 -- RECIPIENT'S CATALOG NUMBER

Leave blank

Block 4 -- TITLE AND SUBTITLE

Final Report of FMVSS 209 compliance testing of AutoKraft rear outboard Type 2 seat belt assemblies being installed in 20XX Ace Super Coupes, AutoKraft P/N 12345678

Block 5 -- REPORT DATE

March 1, 20XX

Block 6 -- PERFORMING ORGANIZATION CODE

ABC

Block 7 -- AUTHOR(S)

John Smith, Project Manager
Bill Doe, Project Engineer

Block 8 -- PERFORMING ORGANIZATION REPORT NUMBER

ABC-DOT-209-001

14. REPORTS....Continued

Block 9 -- PERFORMING ORGANIZATION NAME AND ADDRESS

ABC Laboratories
405 Main Street
Detroit, MI 48070

Block 10 -- WORK UNIT NUMBER

Leave blank

Block 11 -- CONTRACT OR GRANT NUMBER

DTNH22-20XX-D-12345

Block 12 -- SPONSORING AGENCY NAME AND ADDRESS

US Department of Transportation
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance (NVS-220)
400 Seventh Street, SW, Room 6111
Washington, DC 20590

Block 13 -- TYPE OF REPORT AND PERIOD COVERED

Final Test Report
Feb. 15 to Mar. 15, 20XX

Block 14 -- SPONSORING AGENCY CODE

NVS-220

Block 15 -- SUPPLEMENTARY NOTES

Leave blank

14. REPORTS....Continued

Block 16 -- ABSTRACT

Compliance tests were conducted on AutoKraft rear outboard Type 2 seat belt assemblies being installed in 20XX Ace Super 2-door coupes in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-209-XX for the determination of FMVSS 209 compliance. Test failures identified were as follows:

None

NOTE: Above wording must be shown with appropriate changes made for a particular compliance test. Any questions should be resolved with the COTR.

Block 17 -- KEY WORDS

Compliance Testing
Safety Engineering
FMVSS 209

Block 18 -- DISTRIBUTION STATEMENT

Copies of this report are available from --

National Highway Traffic Safety Administration
Technical Information Services (TIS)
Room 5108 (NPO-230)
400 Seventh St., SW
Washington, DC 20590
Telephone No.: 202-366-4946

Block 19 -- SECURITY CLASSIFICATION OF REPORT

Unclassified

Block 20 -- SECURITY CLASSIFICATION OF PAGE

Unclassified

Block 21 -- NUMBER OF PAGES

Add appropriate number

14. REPORTS....Continued

Block 22 -- PRICE

Leave blank

14.3.4 TABLE OF CONTENTS

Final test report Table of Contents shall include the following:

Section 1 — Purpose of Compliance Test

Section 2 — Compliance Data Summary

Section 3 — Test Data

Section 4 — Test Equipment List and Calibration Information

Section 5 — Photographs

Section 6 — Notice of Test Failure (if applicable)

15. DATA SHEETS

DATA SHEET 1
SUMMARY OF RESULTS

RETRACTOR TYPE: _____ - ALR; _____ - ELR; GROUP NO.: _____

ELR RETRACTOR SENSITIVITY: _____ - WSI; _____ - VSI; _____ - VWSI

BELT DATE MARKINGS: _____

BELT ASSY MFR.: _____

BELT ASSY PART/MODEL NO.:_____

SELLER/VEHICLE MFR.:_____

SELLER/VEH. MFR. PART/MODEL NO.:_____

LABELING/MARKING REQUIREMENTS: P = PASSED OR F = FAILED P or F

SUMMARY OF RESULTS: (P = Passed, F = Failed, NA = Not Applicable)

(Continued on next page)

15. DATA SHEETS....Continued

No.	Test Title:	Group Number	A	A	A	B	B	B	C	C	C
		Specimen No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
01	General Requirements										
02	Webbing Width	Pelvic Type ___									
		Upper Torso									
03	Webbing Elongation	Pelvic Type ___									
		Upper Torso									
04	Webbing Breaking Strength	Pelvic Type ___									
		Upper Torso									
05	Resistance to Light	Pelvic Type ___									
		Upper Torso									
06	Resistance to Micro-Organisms	Pelvic Type ___									
		Upper Torso									
07	Webbing Breaking Strength	Pelvic Type ___									
		Upper Torso									

REMARKS:

RECORDED BY: _____ DATE:_____

APPROVED BY: _____

15. DATA SHEETS....Continued

No.	Test Title:	Group Number	D	D	D
		Specimen No.	**10**	**11**	**12**
01	General Requirements				
02	Webbing Width	Pelvic Type ___			
		Upper Torso			
03	Webbing Elongation	Pelvic Type ___			
		Upper Torso			
04	Webbing Breaking Strength	Pelvic Type ___			
		Upper Torso			
05	Resistance to Light	Pelvic Type ___			
		Upper Torso			
06	Resistance to Micro-Organisms	Pelvic Type ___			
		Upper Torso			
07	Webbing Breaking Strength	Pelvic Type ___			
		Upper Torso			

REMARKS:

RECORDED BY: _____ DATE: _____

APPROVED BY: _____

15. DATA SHEETS....Continued

No.	Test Title:	Group Number	A	A	A	B	B	B	C	C	C
		Specimen No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
08	Web Breaking Strength After Resistance to Abrasion	Pelvic Type ___									
		Upper Torso									
09	Hardware Corrosion Resistance										
10	Hardware Temperature Resistance										
11	Hardware Buckle Latch										
12	Loop Load	Pelvic Type ___									
		Upper Torso									
13	Elongation	Pelvic Type ___									
		Upper Torso									
14	Buckle Release Force	Pelvic Type ___									
		Upper Torso									
15	Common Hardware Load	Pelvic Type ___									
		Upper Torso									
16	Cut Webbing Strength	Pelvic Type ___									
		Upper Torso									
17	Retractor Load	Pelvic Type ___									
		Upper Torso									

RECORDED BY: _____ DATE:_____

APPROVED BY: _____

15. DATA SHEETS....Continued

No.	Test Title:	Group Number	A	A	A	B	B	B	C	C	C
		Specimen No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
18	Retractor Performance-- Baseline Characteristics										
19	Post Corrosion Cycling (2,500 cycles)										
20	Post Temperature Cycling (2,500 cycles)										
21	Dust Test										
22	Additional Cycling (5,000 to 45,000 cycles)										
23	Post Test Retractor Performance										
24	Minimum Retractor Strength	Pelvic Type ___									
		Upper Torso									

REMARKS:

RECORDED BY: _____ DATE:_____

APPROVED BY: _____

15. DATA SHEETS....Continued

No.	Test Title:	Group Number	D	D	D
		Specimen No.	**10**	**11**	**12**
08	Web Breaking Strength After Resistance to Abrasion	Pelvic Type ___			
		Upper Torso			
09	Hardware Corrosion Resistance				
10	Hardware Temperature Resistance				
11	Hardware Buckle Latch				
12	Loop Load	Pelvic Type ___			
		Upper Torso			
13	Elongation	Pelvic Type ___			
		Upper Torso			
14	Maximum Buckle Release Force	Pelvic Type ___			
		Upper Torso			
15	Common Hardware	Pelvic Type ___			
		Upper Torso			
16	Cut Webbing Minimum Breaking Strength	Pelvic Type ___			
		Upper Torso			
17	Retractor Load	Pelvic Type ___			
		Upper Torso			

REMARKS:

RECORDED BY: _____ DATE: _____

APPROVED BY: _____

15. DATA SHEETS....Continued

No.	Test Title:	Group Number	D	D	D
		Specimen No.	**10**	**11**	**12**
18	Retractor Performance--Baseline Characteristics				
19	Post Corrosion Cycling (2,500 cycles)				
20	Post Temperature Cycling (2,500 cycles)				
21	Dust Test				
22	Additional Cycling (5,000 to 45,000 cycles)				
23	Post Test Retractor Performance				
24	Minimum Retractor Strength	Pelvic Type ___			
		Upper Torso			

REMARKS:

RECORDED BY: _____ DATE: _____

APPROVED BY: _____

15. DATA SHEETS....Continued

DATA SHEET 2
TEST RESULTS FOR SPECIMENS 1, 2 & 3

GROUP NO.: _____ TEST DATE:_____

GENERAL REQUIREMENTS TEST DATE:_____
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		1	2	3
A	Hardware Free of Burrs			
B	Buckle Release Design, etc.			
C	Attachment Hardware - Complete per SAE J800b			
D	Webbing -- End Ravel and Buckle Pull-Out			
E	Permanent Marking (Label Contents)			

REMARKS:

WEBBING WIDTH (Minimum = 46 mm) TEST DATE:_____
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		1	2	3
A	Pelvic Belt (Type ___) Width (@22 N-T1 /9786±450 N-T2), mm			
B	Upper Torso Belt Width (@9786 N), mm			
C	Pelvic Belt Pass/Fail			
D	Upper Torso Belt Pass/Fail			

REMARKS:

15. DATA SHEETS....Continued

MAXIMUM WEBBING ELONGATION TEST DATE:_____
(Pelvic Belt=20%-T1/30%-T2 @ 11,120 N; Upper Torso Belt=40% @ 11,120 N)
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		1	2	3
A	Pelvic Belt (Type ___), percent			
B	Upper Torso Belt, percent			
C	Pelvic Belt Pass/Fail			
D	Upper Torso Belt Pass/Fail			

REMARKS:

MIN. WEBBING BREAKING STRENGTH TEST DATE: _____
(Pelvic Belt=26,689 N -T1/22,241 N-T2; Upper Torso Belt=17,793 N)
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		1	2	3
A	Pelvic Belt (Type ___), N			
B	Upper Torso Belt, N			
C	Pelvic Belt Pass/Fail			
D	Upper Torso Belt Pass/Fail			

REMARKS:

RECORDED BY: _____ DATE: _____

APPROVED BY: _____

15. DATA SHEETS....Continued

DATA SHEET 3
TEST RESULTS FOR SPECIMENS 4, 5 & 6

GROUP NO.: _____ TEST DATE:_____

WEBBING RESISTANCE TO ABRASION
(Test Method: ___ Hex Bar OR ___ Buckle; Spec=2500 cycles)
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		4	5	6
A	Buckle Test			
B	Hex Bar Test			
C	Buckle Test Pass/Fail			
D	Hex Bar Test Pass/Fail			

REMARKS:

BREAK STRENGTH AFTER ABRASION TEST TEST DATE: _____
(Median Pelvic Belt Spec=20,017 N-T1/16,681 N -T2; Median Upper Torso Belt Spec=13,345 N)
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		4	5	6
A	Pelvic Belt (Type ___)Buckle Test, N			
B	Pelvic Belt (Type ___) Hex Bar Test, N			
C	Upper Torso Belt Buckle Test, N			
D	Upper Torso Belt Hex Bar Test, N			
E	Pelvic Belt Buckle Test Pass/Fail	_____ median value		
F	Pelvic Belt Hex Bar Test Pass/Fail	_____ median value		
G	Upper Torso Belt Buckle Test Pass/Fail	_____ median value		
H	Upper Torso Belt Hex Bar Test Pass/Fail	_____ median value		

RECORDED BY: _____ DATE: _____

APPROVED BY: _____

15. DATA SHEETS....Continued

DATA SHEET 4
TEST RESULTS FOR SPECIMENS 7, 8 & 9

GROUP NO.: _____ TEST DATE:_____

CORROSION RESISTANCE
(Spec=24 hr exposure time)
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		7	**8**	**9**
A	Attachment Hardware Pass/Fail			
B	Other Hardware Pass/Fail			

REMARKS:

TEMPERATURE RESISTANCE TEST DATE:_____

(Spec=48 hrs @ 80°C ± 1°C or 176°F ± 1.8°F)
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		7	**8**	**9**
A	Parts Deteriorated -- Pass/Fail			

REMARKS:

15. DATA SHEETS....Continued

BUCKLE LATCH TEST DATE: _____
(Spec=200 cycles @ 133 N ±13 N force; False Latching Spec=22 N max separation force)
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		7	**8**	**9**
A	Buckle Latch Pass/Fail			
B	False Latching Force, N			
C	False Latching Pass/Fail			

REMARKS:

ASSEMBLY PERFORMANCE - LOOP LOAD TEST DATE: _____
(Pelvic Belt Load Spec=22,241 N min.; Upper Torso Belt Load Spec=13,345 N min.)
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		7	**8**	**9**
A	Pelvic Belt (Type __) Loop Load, N			
B	Upper Torso Belt Loop Load, N			
C	Pelvic Belt Pass/Fail			
D	Upper Torso Belt Pass/Fail			

REMARKS:

15. DATA SHEETS....Continued

ASSY PERFORMANCE - MAX ELONGATION TEST DATE: _____
(Pelvic Belt Spec=356 mm-T1/508 mm-T2@22,241 N; Upper Torso Belt Spec=508 mm @13,344 N)
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		7	**8**	**9**
A	Pelvic Belt (Type __) Elongation, mm			
B	Upper Torso Belt Elongation, mm			
C	Pelvic Belt Pass/Fail			
D	Upper Torso Belt Pass/Fail			

REMARKS:

ASSEMBLY PERF - MAX BUCKLE REL FORCE TEST DATE: _____
(Spec=133 N max. @ 667 N loop load)
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		7	**8**	**9**
A	Buckle Release Force, N			
B	Buckle Release Force Pass/Fail			

REMARKS:

15. DATA SHEETS....Continued

ASSY PERFORMANCE - COMMON HARDWARE TEST DATE:_____
(Min. Spec=26,689 N Loop/13,345 N Tensile)
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		7	8	9
A	Common Hardware Load, N			
B	Common Hardware Pass/Fail			

REMARKS:

ASSY PERF - MINIMUM CUT WEBBING STRENGTH TEST DATE: _____
(Pelvic Belt Load Spec=18,683 N-T1/15,569 N-T2; Upper Torso Belt Load Spec=12,455 N)
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		7	8	9
A	Pelvic Belt (Type __) Loop Load, N			
B	Upper Torso Belt Loop Load, N			
C	Pelvic Belt Pass/Fail			
D	Upper Torso Belt Pass/Fail			

REMARKS:

RECORDED BY: _____ DATE:_____

APPROVED BY: _____

15. DATA SHEETS....Continued

DATA SHEET 5
TEST RESULTS FOR SPECIMENS 10, 11 & 12

GROUP NO.: _____ TEST DATE:_____
RETRACTOR PERFORMANCE - BASELINE CHARACTERISTICS
(Pelvic Belt Force Spec=3 N min.; Upper Torso Belt Force Spec=1 N to 5 N;
Webbing Travel Before Lockup Spec=25 mm max.)
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		10	**11**	**12**
A	Avg Force (ALR) Between 75%+51 mm & 75%-51 mm, N			
B	Lowest Retraction Force (ELR), N			
C	Webbing Travel Before Lockup (ALR), mm			
D	Webbing Travel Before Lockup (Web Sensitive ELR)			
	Retractor Accel to 2.8 m/s^2 (0.28G) @ 0° Angle, mm			
	Retractor Accel to 7.2 m/s^2 (0.72G) @ 0° Angle, mm			
	Retractor Accel to 7.2 m/s^2 (0.72G) @ 45° Angle, mm			
	Retractor Accel to 7.2 m/s^2 (0.72G) @ 90° Angle, mm			
	Retractor Accel to 7.2 m/s^2 (0.72G) @ 135° Angle, mm			
	Retractor Accel to 7.2 m/s^2 (0.72G) @ 180° Angle, mm			
E	Webbing Travel Before Lockup (Veh Sensitive ELR)			
	Retractor Accel. to 2.8 m/s^2 (0.28G) @ 0° Angle & to 7.2 m/s^2 (0.72G) in 2 Directions - Secure Webbing & Accelerate Retractor, mm			
	X (Parallel to Vehicle Centerline), mm			
	Y (90º to Vehicle Centerline), mm			
	Pelvic Belt (Type __) Retractor Pass/Fail			
	Upper Torso Belt Retractor Pass/Fail			

NOTE: Retractors must lockup at or above 7.2 m/s^2 (0.72G) & cannot lockup at or below 2.8 m/s^2 (0.28G) for first 51 mm of webbing.

REMARKS:

15. DATA SHEETS....Continued

RETR PERF - POST CORROSION CYCLING (2500) TEST DATE:_____
(Spec=24 hr salt spray, 1 hr dry, 4 wash cycles- 38°C (100°F) water & 25 manual cycles)
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		10	**11**	**12**
A	Precycling Retractor Performance Pass/Fail			
B	2,500 Automatic Cycles Pass/Fail			

REMARKS:

RETR PERF - POST TEMPERATURE CYCLING (2500) TEST DATE: _____
(Spec=48 hr temp cond period of 24 hrs @ 80°C ± 1°C or 176°F ± 1.8°F over water +
24 hrs. @ 80°C ± 1°C or 176°F ± 1.8°F dry oven)
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		10	**11**	**12**
A	25 Manual Cycles Pass/Fail			
B	2,500 Automatic Cycles Pass/Fail			

REMARKS:

RETRACTOR PERFORMANCE - DUST TEST TEST DATE:_____
(Spec=5 hr cond period)
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		10	**11**	**12**
A	Pass/Fail			

REMARKS:

15. DATA SHEETS....Continued

RETRACTOR PERFORMANCE - CYCLING TEST DATE: _____
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		10	**11**	**12**
A	Retractor Performance - 25 manual cycles - Pass/Fail			
B	FOR ALR - 5,000 cycles @ 100% extension and 89 N load - Pass/Fail			
C	FOR ELR - 35,000 cycles @ 50% extension and 89 N load - Pass/Fail			
D	FOR ELR - 10,000 lockup cycles @ 50% extension and 89 N load - Pass/Fail			

RETR PERF - POST TEST CHARACTERISTICS TEST DATE: _____
(Actual Values)
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		10	**11**	**12**
A	Avg Force (ALR) Between 75%+51 mm & 75%-51 mm, N			
B	Lowest Retraction Force (ELR), N			
C	Percent of BASELINE (minimum = 50%), percent			
D	Webbing Travel Before Lockup (ALR), mm			
E	Pass/Fail			
F	Webbing Travel Before Lockup (Web Sensitive ELR)			
	Retractor Accel to 2.8 m/s^2 (0.28G) @ 0° Angle, mm			
	Retractor Accel to 7.2 m/s^2 (0.72G) @ 0° Angle, mm			
	Retractor Accel to 7.2 m/s^2 (0.72G) @ 45° Angle, mm			
	Retractor Accel to 7.2 m/s^2 (0.72G) @ 90° Angle, mm			
	Retractor Accel to 7.2 m/s^2 (0.72G) @ 135° Angle, mm			
	Retractor Accel to 7.2 m/s^2 (0.72G) @ 180° Angle, mm			

(Table continued on next page)

15. DATA SHEETS....Continued

		SPECIMEN NUMBER		
		10	**11**	**12**
G	Webbing Travel Before Lockup (Veh Sensitive ELR)			
	Retractor Accel. to 2.8 m/s^2 (0.28G) @ 0° Angle & to 7.2 m/s^2 (0.72G) in 2 Directions - Secure Webbing & Accelerate Retractor, mm			
	X (Parallel to Vehicle Centerline), mm			
	Y (90° to Vehicle Centerline), mm			
	Pelvic Belt (Type __) Retractor Pass/Fail			
	Upper Torso Belt Retractor Pass/Fail			

REMARKS:

RETR PERF - MIN STRENGTH TEST DATE: _____
(Pelvic Belt Spec=22,241 N-Loop OR 11,120 N-Tensile; Upper Torso Belt/Continuous Webbing System Spec=13,344N-Loop OR 6,672 N-Tensile)
(P = Passed, F = Failed, NA = Not Applicable)

		SPECIMEN NUMBER		
		10	**11**	**12**
A	Pelvic Belt (Type __) Retractor Performance, N			
B	Upper Torso Belt/Contin. Web. Sys. Retr Perf, N			
C	Pelvic Belt Retractor Pass/Fail			
D	Upper Torso Belt/Contin. Web. Sys. Retr. Pass/Fail			

REMARKS:

RECORDED BY: _____ DATE: _____

APPROVED BY: _____

16. FORMS

LABORATORY NOTICE OF TEST FAILURE TO OVSC

FMVSS: 209 TEST DATE: _____

LABORATORY:_____

CONTRACT NO.: _____; DELV. ORDER NO.:_____

LABORATORY PROJECT ENGINEER'S NAME: _____

TEST SPECIMEN DESCRIPTION:_____

_____

MFR. PART NO.: _____; MFR.: _____

SELLER PART NO.: _____; SELLER: _____

TEST FAILURE DESCRIPTION:_____

_____

_____

_____

FMVSS REQUIREMENT, PARAGRAPH §____ : _____

_____

_____

_____

NOTIFICATION TO NHTSA (COTR): _____

DATE: _____ BY:_____

REMARKS:

16. FORMS....Continued

FMVSS 209 MONTHLY STATUS REPORT

Contract No.: _____ Date: _____

A. SUMMARY TABLE

GRP NO.	VEH MFR	VEHICLE MODEL	SEAT BELT MFR	BELT MODEL NO.	DATE RECVD	TEST START DATE	TEST COMPL. DATE	DATE REPT MAILED	COMMENTS
001									
002									
003									
004									
005									
006									
007									
008									
009									
010									
011									
etc.									

B. Tests scheduled for next reporting period (assy. model(s) scheduled for testing):

C. Description of any problems and/or delays in testing:

D. Description of specific actions taken to correct problems and/or delays: